COMPUTERWORLD

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Worst Problem: Sore Feet

Estimated 26,665 Attend DP Conference

Afips Executive Director Bruce Gilchrist, President Richard I. Tanaka, and Secretary Richard G. Canning face the press. (CW Photo by Farmer)

By Drake Lundell
CW Staff Writer

ATLANTIC CITY, N.J. – It's over.

The computer community survived the 36th semi-annual Joint Computer Conference in this resort town's cavernous Convention Hall last week despite sore feet, hustle and bustle, and almost more information than could be digested in three days.

The Spring Joint Computer Conference here was one of the smoothest in recent memory aided by lower than expected attendance, an alert arm of the telephone company, adequate accommodations and an experienced arrangements committee and convention staff.

Sponsored by the American Federation of Information Processing Societies, the combination circus and serious technical discussions drew 26,665 people according to initial attendance estimates. In the past the final attendance figures have usually been lower than the initial estimates due to duplications on the registration lists. Most observers feel that the total show attendance will fall short of 25,000.

The attendance figures were well below the 40,000 figure projected earlier this year by Afips, but the 25,000 who actually made it still crowded the hall, although not to the extent of recent years.

Of those attending, more than half were either exhibitors or exhibitor guests, with around 40% registered for both the exhibits and the technical sessions, according to early Afips estimates.

The results were also borne out by an initial analysis of the responses to an attendance survey conducted by CW. The early results from the floor sample showed that approximately half of those in attendance would come to the show just for the technical sessions, while the other half were more interested in the exhibits.

Problems Minimized

The problems of poor hotel accommodation, long lines, poor telephone service, and overcrowding that have become the trademark of recent JCCs were almost completely absent this year and even the weather cooperated with four beautiful days for the show after a rainy start the day before the convention opened.

The Southern New Jersey Bell Telephone Co. "should be roundly applauded," according to one exhibitor who spoke for many of his compatriots. Many exhibitors remember the poor service at the Fall Joint Computer Conference in Las Vegas last year and the crippling telephone strike when the SJCC last visited Atlantic City in 1968.

The problem of hotel accommodations that made life miserable for many of the attendees in Boston last Spring was completely absent here. While Boston could only provide 9,000 rooms for guests, Atlantic City offered more than double that figure.

Lines were kept at a minimum during this show through new registration procedures that al-

(Continued on Page 2)

Enforceable Code for DP People Proposed by Afips Study Group

ATLANTIC CITY, N.J. – A committee sponsored by the American Federation of Information Processing Societies last week called for the development of a code of professional conduct for the computer and information processing field.

The group, chaired by former Secretary of Labor Willard Wirtz, also proposed the development of a broad national certification program for computer personnel and the establishment of a special body to enforce the provisions of the proposed code.

The code would be established by a new committee under Afips auspices, according to the initial report. The development of codes and standards for the information processing field should initially be funded by Afips, the group said. Afips sources, however, indicated that the Department of Commerce might be interested in sponsoring the activity.

Announcement of the recommendations contained in the report was made by Dr. Richard I. Tanaka, president of Afips, during SJCC. The special group on professional standards met last January in Washington, D.C.

The interdisciplinary meeting was held on Jan. 21 and 22 at The Airlie Foundation Conference Center near Warrenton, Va. Participants included leading individuals drawn from the legal profession, industry, commerce and finance, the academic community, management consulting, and professional bodies in the information processing field, Tanaka said.

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$39/mo Terminal Gone As Viatron Ups Prices

By Michael Merrit
CW Staff Writer

ATLANTIC CITY, N.J. – If you want to rent a System 21, don't call Viatron. The only person who might be able to rent it to you is your local Viatron dealer–at a healthy mark-up. The famous $39/mo terminal apparently has passed into history.

Viatron announced at the SJCC that is was going out of the leasing business. The company also revealed the first break in its price structure.

The cost of the 2101 microprocessor was raised 70% to $1,640, while the price of the Viatape recorder was boosted from $196 to $384.

In addition, all black and white video displays will be sold for $384, previously the first display for each system was supplied free.

Earlier last week the terminal maker laid off 294 of its 1,100 employees.

In an interview at the SJCC, Dr. Edward Bennett, president of Viatron, said the majority of the layoffs were in the administrative area, and that only 22 technical people and "a few production supervisors" had been let go.

Bennett claimed the layoffs would save Viatron $8 million/year in overhead and salary.

Commenting on the price increase, Ted Smith, vice-president of Sycor, said that it was "unreasonable [for Viatron] to expect that much hardware to be sold at those prices." He added: "I would expect additional increases."

Bennett said that his company didn't plan any further changes in its price structure "in the foreseeable future."

Viatron has not been leasing any large number of terminals for several months. At the company's annual meeting last month, Bennett said that the sale to lease ratio had been running 85% to 90% in favor of sales.

Leases are available from dealers at rates much higher than Viatron's.

Bennett attributed both the price increases and the layoffs to the need to "make the company profitable as quickly as possible." He said a line of credit the company has arranged is contingent on Viatron sales.

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Spring Joint 'Problems' Minimized

(Continued from Page 1)

lowed Afips to register 1,700 in a one-hour time span. Although the registration lines were short, many reported delays in gaining access to the men's rooms on the convention floor and at some of the "go-go" clubs of this not-so-staid resort.

In addition to new registration procedures at the convention hall, the show organizers also attempted a "distributed registration" scheme for the first time by allowing guests to register for the conference at their hotels the night before the show.

IBM 360-compatible peripherals, communications, and minicomputers highlighted the show. The emphasis on communications began with the keynote address by Sam Wyly of University Computing Co. and was continued at several technical sessions.

The Wyly speech called for the establishment of a task group to study the entire range of computers and communications and to report back to Afips by the Fall Joint. Afips said that the effort would not be made, especially not by the Fall Joint, since the Afips board will not consider the proposal for at least a month.

Some of the exhibits were very educational, some flashy, and some "probably shouldn't have been there," according to an Afips official. The exhibits covered 100,000 sq ft of floor space in the convention hall with another 100,000 given over to aisles, etc.

A quick review of the exhibits indicated that there were fewer new products this year than in the past few joint computer conferences, but there was an upswing in the number of previously announced products that were being shown for the first time.

Social implications of computers and computing was also promoted both in the technical sessions and by the Computer Professional for Peace, which was given a place to distribute literature for the first time. Disruptive tactics were completely absent from the show, even while the rest of the country was experiencing an upsurge of student unrest.

An international flavor was evident at the convention with exhibits from both International Computers Ltd. of England and Hitachi of Japan. There was also a large contingent of interested observers from Fujitsu in Japan and a number of visitors from Holland, who said they were amazed by all of the equipment.

Response to the technical sessions indicated that most of the attendees found them adequate, with few downgrading them and not many overly praising them.

The one major problem area for exhibitors was caused by the trucking strike, but the exhibitors affected overcame the threat. In all, 800 tons of freight were moved into the show in more than 350 vehicles including six station wagons and 125 private cars.

Jacobi Systems Corp. was the only exhibitor really hit hard by the strike. The firm's Minits II system arrived damaged. The loss was estimated at $160,000. The firm speculated that the truck carrying the unit had been detoured to avoid a section of possible Teamster violence and that a rough road caused the damage.

Once again, the attendees at the show seemed to come primarily from the ranks of the manufacturers and not from among the users—another factor that seems to be becoming a tradition at the JCCs.

However, one old JCC had said that she thought that the users would "have a great opportunity to see new equipment and discover new suppliers," if they would attend the shows.

Enforceable Code Proposed by Afips Group

(Continued from Page 1)

The January meeting recommended the development of standard proficiency tests covering positions in the computer field and the development of universal job descriptions to serve as the basis for such tests, according to Tanaka.

In addition, he said the group recommended increased efforts in the areas of accreditation of private EDP schools, statistical research on the employment situation in the computer field, and broad information programs directed to the general public and user groups directly involved with computer-related services.

The meeting at Airlie indicated that "the growth of the computing field and the impact of its activities have reached the point where establishment of a sound, enforceable code should be considered to help assure a high level of professional conduct and a strong awareness of public responsibility," the Afips president said.

"Accordingly," he added, "Afips will undertake further study in this area.... The preliminary study will be pointed to defining provisions of such a code, possible methods of enforcement, and any additional activities or services needed to assist in implementation of the code and to protect the public interest."

The first step will be the development of universal job descriptions and requirements. "Such descriptions," Tanaka said, "will be developed through close cooperation with representative organizations in the computing field and would be flexible so that individual organizations could amplify or modify the basic document in keeping with their own specific requirement."

In addition, the special group on accreditation was unanimous in recommending that major strides must be taken in the accreditation of private EDP schools to assure that students receive adequate training for entry-level positions in the field.

To do this, Tanaka said, the new Afips-sponsored group will coordinate its efforts with the present Ad Hoc Committee on EDP School Education, which is chaired by Dr. Bruce Gilchrist, Afips executive director.

Afips Group Plans

The new Afips-sponsored group has not been selected yet, Tanaka said, but funds have been allocated for its activities during the coming year. Additional funding for the standards selection group will be solicited from other organizations in the computer field as well as from the federal government, Afips sources said.

Afer the proposed organization establishes the standards for the computer industry, the initial group recommends that strong enforcement procedures be established, Tanaka said.

A code of conduct and responsibility without adequate provisions for enforcement, he said, would be worthless. While the group recommends that the code be rigorously enforced, he added, the organization of the code enforcement group should be voluntary.

The grievances that would be heard by such a group would most likely involve conflicts between the public and organizations offering computer services and between suppliers and users of computer equipment, Richard Canning, Afips secretary said.

The codes of conduct to be established, Canning added, would also involve the relationship between employers and employees in the computer industry and suitable grievance procedures for such conflicts would also be established.

The grievance procedure would probably involve public panels that would hear complaints among these groups, Canning said. If the dispute could not be settled amicably between the involved parties, the panels would issue statements creating "adverse publicity" for the code violators, he added.

The grievance panels, as presently envisioned, would not have any other powers except the exposure of code breakers, he said, but such panels could make it very hard on "wrong-doers" who break the professional codes of the industry.

DP Accessories Include Cleaners, Certifiers, and Back-Coated Tape

ATLANTIC CITY, N.J. – A few new data processing accessory products were shown at the SJCC, but the majority of the products had been previously announced.

A number of magnetic tape cleaning and evaluating devices were exhibited. Computer-Link Corp., Burlington, Mass., showed its Model 200 tape evaluator which tests, cleans, and rewinds tapes with 7- or 9-channel formats. The Computer-Link Model 100 magnetic tape cleaner/rewinder with an operating speed of 180 in./sec was also shown.

The Mark-II magnetic tape cleaner was displayed by Data Devices, Inc., Tarzana, Calif. Another tape cleaning device was the Model E-24 magnetic tape cleaning system from Kybe Corp., Waltham, Mass. The E-24 features a double cleaning cycle in less than five minutes at 200 in./sec.

Kybe also exhibited its TMS200 tape certifier which tests, cleans, and rewinds at 200 in./sec, and its DP20 disk pack cleaner.

The main supplies shown at the SJCC were Astron back-coated magnetic tape made by Memorex, and NCR carbonless paper.

Suppliers of storage devices for paper tape and cards, magnetic tape and disk packs were conspicuous by their absence.

The Polaroid CU-5 hard copy Land Camera with hood to fit CRT display screens was shown at the Sanders Data Systems, Inc. booth.

POM

The Model 401 formstacker from Advanced Terminals Inc. in operation accommodates fanfold forms and stacks forms at 2,000 line/min. Advanced Terminals also demonstrated a prototype of its Model 1000 Formscopier which will sell at $4,800.

The Formscopier uses a microcopying method called POM (Printer Output Microfilm) and copies continuous fanfold forms in microfilm at 20,000 line/min. A spokesman said that availability date for the product has not been set.

Paper Tape Readers

Paper tape readers on show included the Model HS-300-DEC, by Dataterm Inc., which is designed to operate as a 300-char/sec reader on the DEC PDP-8L I/O bus. The reader will sell for $1,795 and is compatible with DEC Teletype software.

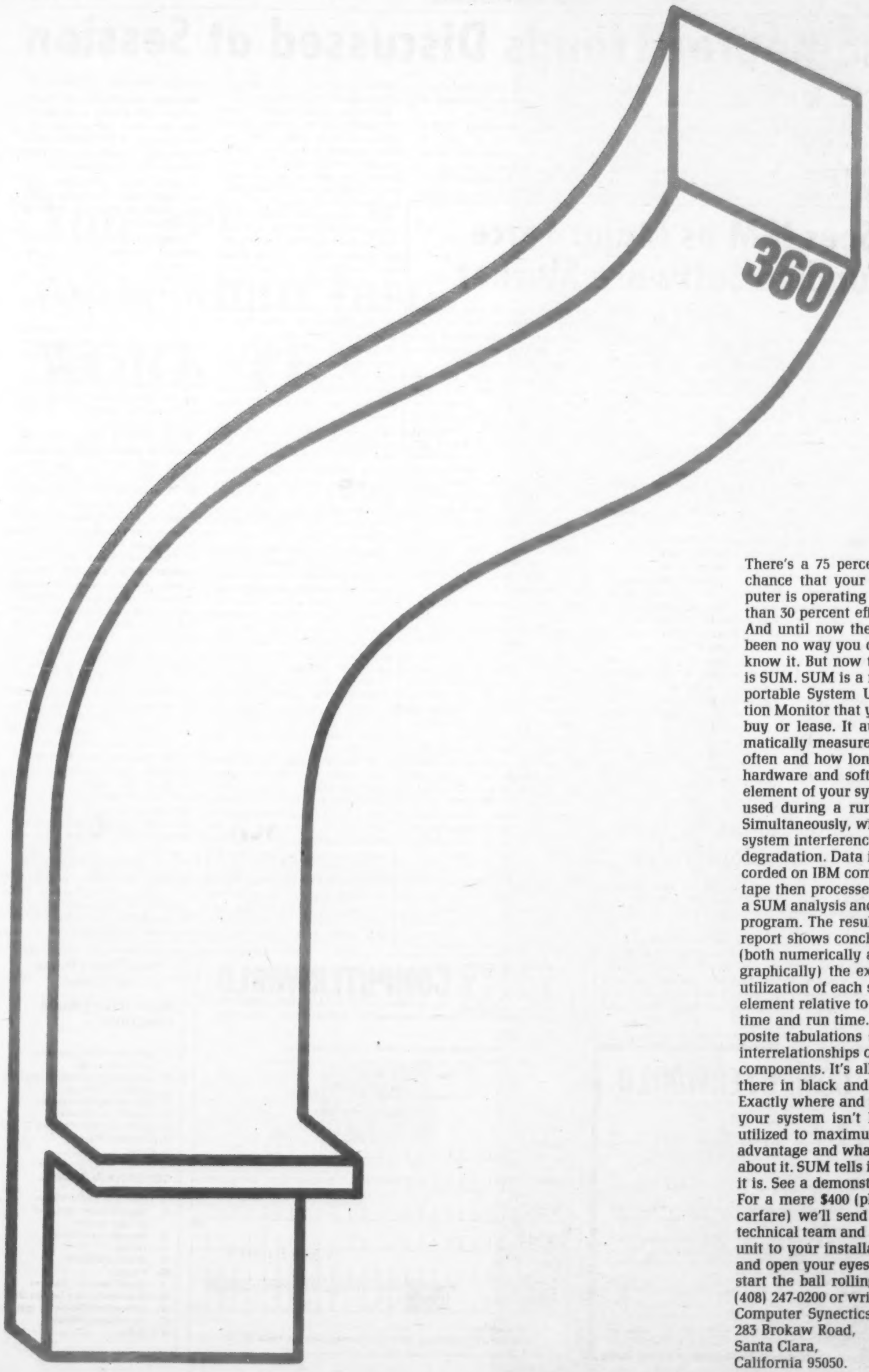
The Dataterm HS-300 photoelectric tape reader was also at the company booth.

The HS-300 reads character by character photoelectrically at up to 300 char/sec, with maximum reader response under 3 msec.

A system monitor to provide warnings of deviation in computer power, temperature and humidity was shown by Airoyal Manufacturing Co.

A conversion device on display was a paper tape to magnetic tape converter made by Digi-Data Corp. Called the Model 1720, the device can transcribe 2.5 million characters per eight hour shift.

Microfilm equipment shown included a COM recorder which reads magnetic tape and produces pages of printouts in 35mm frames made by Information International. NCR had on show an ultrafiche reader, a COM microfiche reader, and a microfiche reader.



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Minicomputer Trends Discussed at Session

ATLANTIC CITY, N.J. – The session on minicomputers at the SJCC was characterized by an overview of the current status and future developments in the small-computer industry.

The session, entitled "Minicomputers–The Profile of Tomorrow's Components," was chaired by Reg A. Kaenel and featured the presentation of four papers.

The papers presented were: "A New Architecture for Minicomputers–The DEC PDP-11," "A Multiprogramming, Virtual Memory System for a Small Computer," "Applications and Implications of Minicomputers," and "A Systems Approach to Minicomputer I/O."

The paper describing PDP-11 was authored by G. Bell, R. Cady, R. McFarland, B. Delagi, J. O'Laughlin and R. Noonan, all of the Digital Equipment Corp., and W. Wulf of the Carnegie-Mellon University. Cady delivered a summary of the paper.

According to the paper, early constraints often created computing designs with what we now consider weaknesses. These include limited addressing capability, few registers, no hardware stack facilities, and limited priority interrupt structures.

Early designs also lacked byte string handling, ROMs, and had very elementary I/O processing. No family concept among minis was in evidence, and the required machine language increased programming costs.

The paper describes the design of the PDP-11 in order that it might solve these problems.

The advent of integrated circuit semiconductor technology and the availability of application experience are said to make possible the solutions of these problems.

The DEC PDP-11, Model 20, according to the paper, is the first computer of a family designed to span a range of functions and performance. The Model 20 is specifically discussed although design guidelines are presented for other PDP-11 systems.

The Model 20 would nominally be classified, the authors said, as a third generation 16-bit word, central processor with eight bit bytes of primary core memory. Though designated as a general register processor, the operand accessing mechanism allows it to perform equally well as a 0- (stack) 1- (general register), and 2- (memory-to-memory) address computer. The computer's components (processor, memories, controls, terminals) are connected via a single switch, called the Unibus.

A related paper, "A Systems Approach to Minicomputer I/O," by Fred F. Coury of Hewlett-Packard, said minicomputer performance and development is I/O bound, especially in the man/machine interface area. The paper suggests that the time has arrived when the industry should stand back and look at mini I/O techniques, not in terms of how we can improve on existing techniques, but by analyzing what the users want to do and deciding on the best way to do it.

Another significant point made was that I/O should be designed into, not onto the system. An integrated CPU/software/I/O design will result in optimum performance, the author said.

Coury's paper concluded that new approaches to existing problems might lead users in exciting new directions.

"A Multiprogramming, Virtual Memory System for a Small Computer," was presented by C. Christensen and A.D. Hause of the Bell Telephone Labs.

The interfacing of a large batch-processing computer to six to eight small graphic terminals was stated as being the objective of the system described. A small computer is used to provide the terminals with real-time processing for generating, editing, and manipulating graphical or text files, in the system.

In the system design the small computer passes along the large computer requests for large tasks. Access to the data base in the large computer is provided.

The virtual memory for the small computer is contained on a special, fixed-head disk by Data-Disk, which has 64 tracks, packs 8192 word/track and operates at 1800 rpm. The system handles the conversion of virtual addresses into physical addresses and of making the data available for processing by forwarding data into core from the disk.

The system described in the paper, according to the authors, is currently working stand-alone as the 201 data link to the large computer has not been implemented. It supports four 103 data sets for communication with teletypewriter consoles.

The experiment generated and accessed several tens of thousands of data words with delays due to multiprogramming scarcely noticeable, the authors said, compared to delays due to disk latency.

Referred to as the largest growth segment of the computer industry over the last four or five years, minicomputers will continue the trend into the foreseeable future, according to C.B. Newport of Honeywell.

Panel Sees IBM as Major Force In Unbundled Software Market

ATLANTIC CITY, N.J. – Using the same marketing skills that got it to its present position in the hardware industry, IBM may very well become the leader of the emerging proprietary software industry. That seemed to be the one point made by all four panelists in Wednesday morning's SJCC session on "Propriety Software in the 1970's."

Moderator Martin Goetz of Applied Data Research started the discussion by calling attention to the "chaos" in today's computing industry, which he blamed largely on the hardware manufacturers and their lack of really worthwhile programming help during the '60s.

Professor Irving Kayton of George Washington University said that, while legal considerations may have precipitated the current unbundling situation, the law now offers very little clear cut protection for the industry it has, in effect, spawned.

Mrs. Ruth Block of Equitable Life Assurance said that many users have to look for programs or packages from outside sources, in order to avoid "reinventing the wheel". She said that the user has not only the right, but also the responsibility to let the vendor know what is wanted, rather than just shopping for what is available.

Robert Spieker of AT&T used much of his time to review in detail the thorough evaluation technique the user should employ in considering any program package. He also noted that the buyer should attempt to evaluate the house software itself, in terms of both its cost and programming capabilities.

A software vendor, Robert Hill of Informatics Inc. advocated a set of standards for what he called proprietary programming products. Using that term, he emphasized that the vendor's offerings should be "off-the-shelf" models, rather than custom-modified package programs. In this way, he said, the buyer would have a clear definition of what is available and would also avoid the higher cost of special programming effort.

In his introductory remarks, Goetz noted that the assembly-level languages available in the early '60s were machine-oriented and left the users with poor documentation, heavy logic consideration and no effective transferability from one system to another. The later introduction of high-level languages such as Cobol and PL/1 still left many problems for the user. Instead, Goetz said, users, then as now, really needed generalized program generators, application packages and testing aids.

Kayton noted that the software houses could find little protection under currect law. Patentability of almost anything, he said, was "rather pathetic," and more a game of chance than real protection. The concept of "trade secrets" has recently been put in jeopardy by a court decision, he said, and only legislative action can restore this form of protection. He emphasized however that the software houses should certainly take all legal steps they deem proper in the event these forms of protection are substantiated.

Mrs. Block brought attention to the "upheaval factor" that must be considered when an outside program or application is implemented. She said that the magnitude of the upheaval tends to be in direct proportion to the importance of the application, but that it can be kept within limits with good pre-planning by both vendor and buyer.

Spieker said that unbundling has caused an explosion of software offerings, many very similar to one another, leading to confusion on the part of the buyer. In these circumstances, he said, the buyer's only protection is to work out a clear definition of his requirements and then evaluate the available packages in comparison to those needs. He urged the use of benchmark problems along with the criteria for major application systems.

12-Man Computerworld Team Covers Spring Conference

To bring its readers complete coverage of the Spring Joint Computer Conference, *Computerworld* assigned a special 12-member team of editors, writers, and photographers to Atlantic City last week.

Led by News Editor V.J. Farmer and Technical News Editor Ronald A. Frank, the team included Supplements and Research Editor Peter Briggs, New York Bureau Chief E. Drake Lundell, and staff writers Edward Bride, Donald Leavitt, Christine Magnuson, Michael Merritt, Frank Piasta, Leslie Shean, and Sara Werman. The photographers were Farmer and Mary Upton, who also doubled as a copy editor.

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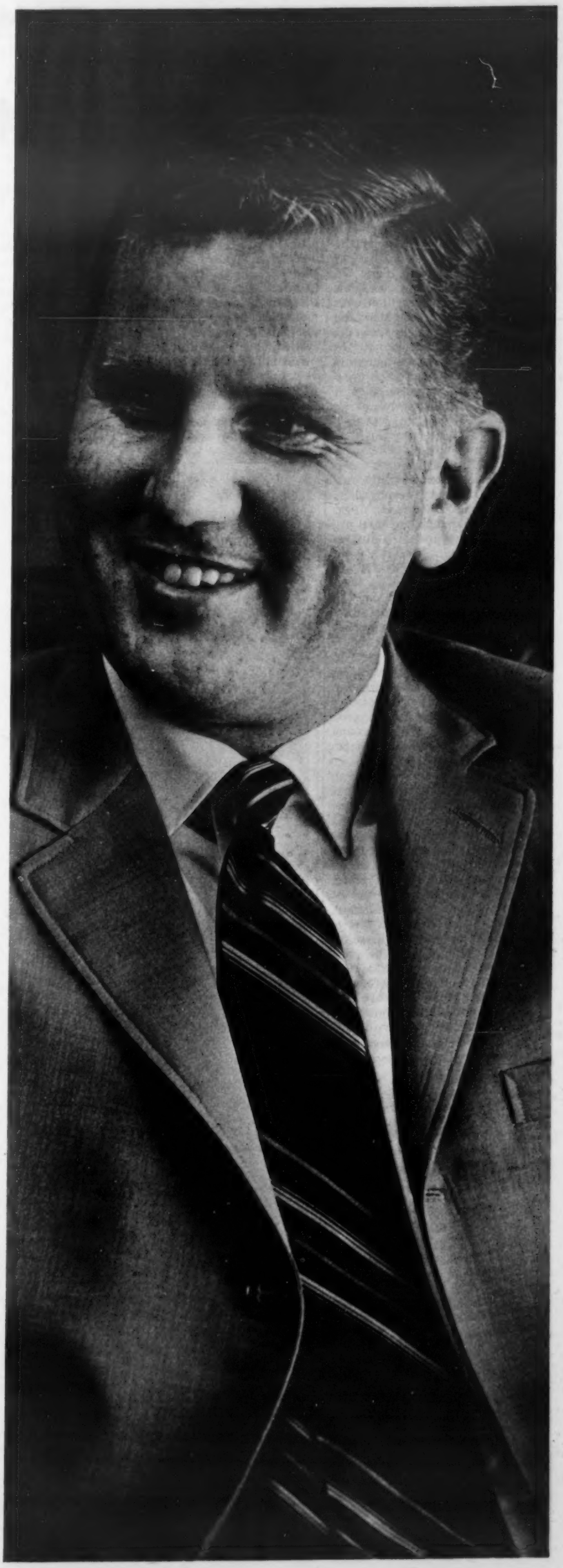

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Primarily an OEM Show?

Small Computers, Peripherals Attract Users

By Frank Piasta
CW Staff Writer

ATLANTIC CITY, N.J. – Small manufacturers of computers and computer peripherals caused the biggest stir at the SJCC, at least as far as the user was concerned.

In a show that was characterized by a veteran exhibitor as being primarily for OBMers, the user still found many new devices to consider.

A dual processor configuration was introduced by Tempo Computers. Called the Tempo II, it features modular hardware and software packages to provide a full range of operating and functional characteristics.

Standard hardware includes 16K of core memory distributed between memory ports, 16 index/arithmetic hardware registers, eight levels of external priority interrupts, multiprogramming controls, a 32K word drum and a Model ASR-33 Teletype.

Hetra introduced its line of small- to medium-size data processing systems. The equipment is available with from 4K to 65K bytes of core memory rated at either 750 nsec or 1/msec.

The Hetra system can be equipped with a variety of peripherals including magnetic tape, disk, card I/O equipment, line and character printers, paper tape, and CRT display.

Current software includes an assembler and a monitor, but Hetra has indicated that Usasi Cobol, Fortran II, and RPG II compilers will be available during the third quarter of 1970.

A preproduction model of the Centronics Mach I series printer was demonstrated. Capable of printing at up to 150 line/min, the impact dot matrix printer can print up to 132 character/line at six line/inch. The company said that interfaces to adapt the unit to the DEC PDP series, the Honeywell 416, the Nova, and the IBM 360 are being developed.

Impact Line Printers

Odec Computer Systems showed two models of its impact line printers. The Model 200 is capable of printing 250 line/min and the Model 400, prints 500 line/min. The Odec printers contain a small processing unit for timing, buffering, and control.

The Odec printers use a character belt mechanism with individual characters that easily snap on and off the belt. The company said this capability facilitates the handling of special characters or codes.

The OEM aspect of the show was illustrated by several devices on display. The Bridge Data Products card reader can read either 80- or 96-column cards by changing the feed and stacking mechanisms. The company said 96-column cards can be read at 600 card/min.

Foreign Manufacturers

Two overseas companies also showed OEM devices. The English firm, ICL, demonstrated a variety of peripherals including optical character and mark reading units, a line printer, a self-threading magnetic tape transport, and a 2,000 card/min reader.

Hitachi of Japan, the other foreign competitor, displayed plug-to-plug, 360-compatible disk drives and controllers. The Model H-8564I seems to be identical in most aspects to the IBM 2311, while the H-8577S multipack drive bears a close resemblance to the IBM 2314 system. The firm is currently planning to make the units available only on an OEM basis to insure the user of adequate maintenance facilities.

Memory Systems

Two firms offered large-scale memory systems for the 360 user. The SSU from Advanced Memory Systems is a semiconductor memory that is said to be between drum memories and bulk core memories in both price and performance. Available in sizes from two to eight million bytes, the SSU is intended for such applications as program storage, multiprocessing, and time-sharing.

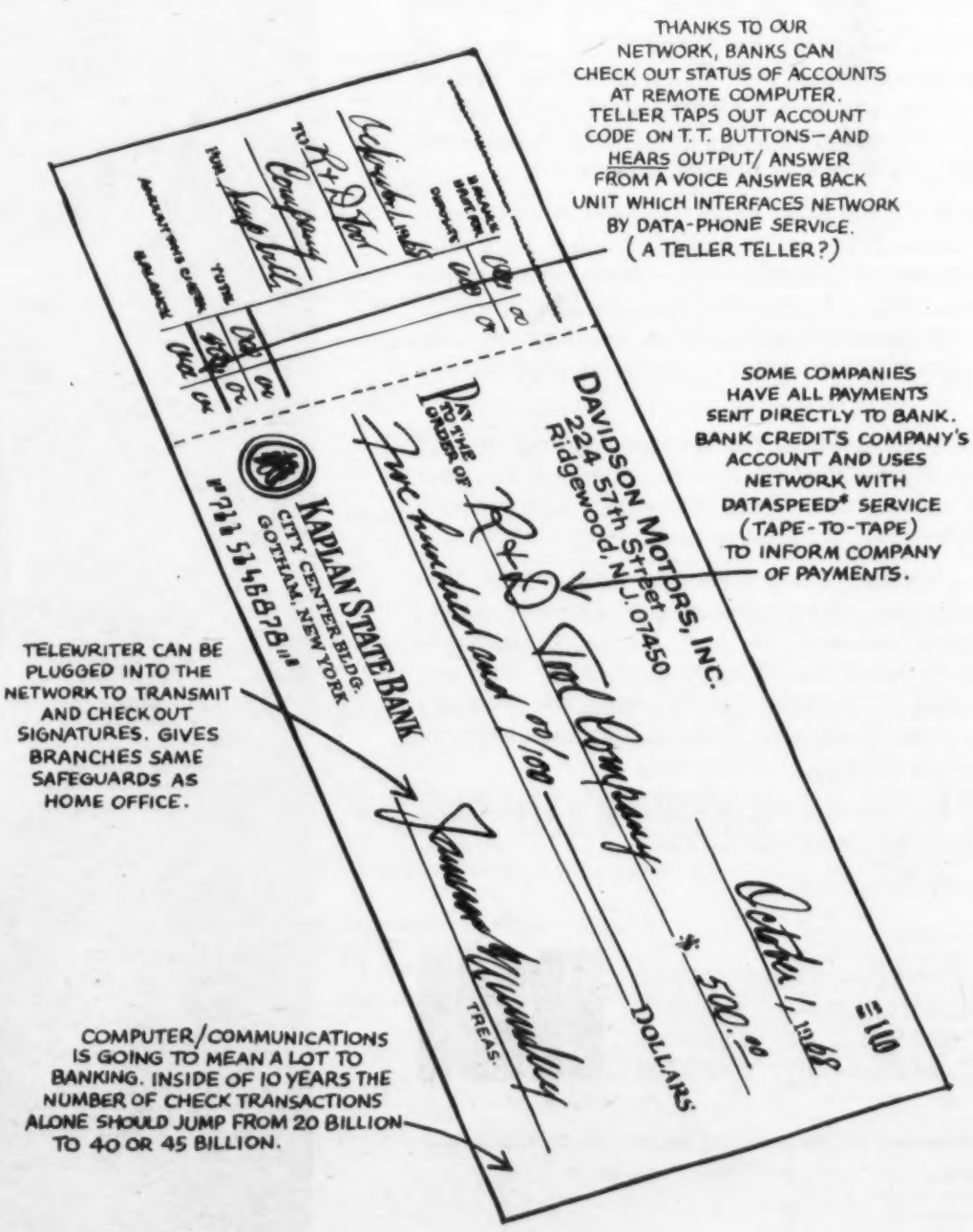
Ampex Corp. exhibited its Model RM-2 extended core memory which is reportedly plug-interchangeable with all IBM computers capable of using large core storage. Ampex said that four of the memories had been installed to date, and plans called for the installation of 50 more units during the coming year.

Automatic threading seemed to be the newest innovation in the area of tape drives supplied by independent peripherals manufacturers. Telex, Ampex, Potter and Storage Technology all introduced their replacements for the IBM 2420/7. A similar drive manufactured for DPF&G was shown by its maker, Bucode.

Potter, in addition, demonstrated models of the rest of its line of automatic threading drives. These are the counterparts of the 2400 series-compatible units that had been introduced earlier.

The proliferation of IBM 360 plug-to-plug compatible devices was evident in the number of firms demonstrating 2314-compatible systems. The companies included California Computer, which is selling and servicing units manufactured by Century Data Systems; Peripherals General; Potter Instruments; Telex Computer Products; and Marshall Data Systems.

Among the more unusual products offered by these independents were the disk controller from Marshall that can be used with 2311- as well as 2314-type drives, and the Peripherals General products that include models with both hydraulic and voice-coil actuators.



Users Offered More Versatility

Software and Measurement Techniques Shown

By Don Leavitt
CW Staff Writer

ATLANTIC CITY, N.J. – Helping the business user solve his problems seemed to be the one common factor in the software and services shown at the SJCC.

Terminal manufacturers introduced units that are programmable by the user. Business-oriented software support was included with the new minicomputers, or added to older models.

Time-sharing networks offered new services aimed particularly at management information needs, and systems measurement/performance evaluation tools were much in evidence.

The Victor 820/03 and 820/04 terminal computers were two of the new "intelligent" terminals. With resident memory for both data and programs, they can use any of the packages from Victor's application library without modification, according to Victor.

The programs, however, can be changed to meet special needs. Users can be trained to do their own systems design and programming work, according to Victor.

The Compat 88-33, a remote batch-entry terminal, uses a 30 in. loop of magnetic tape to hold formatting instructions for reports and data entered by an operator.

Collected on the tape loop, data can be checked and corrected by an operator before being transmitted at high speed to the central processor, the company said.

In the minicomputer area, Monitor Data Corp. demonstrated the MD 708, a unit the size of an attache-case with 101 standard and 16 optional instructions in a macro-assembler language.

Various utility programs including display, alter, and dump routines, and a paper tape source editor, are also available, according to Monitor. The company claimed that the unit is compatible with "any peripherals being shown" at the SJCC.

The Atron 501 Datamanager minicomputer was said to be capable of either fixed-point or decimal arithmetic, and of utilizing 56 macro instructions. The device uses descriptor tables to work with variable length items. The company noted that the software available includes Assembler and RPG in addition to utility programs, confidence tests, and maintenance aids.

Computer Sciences Corp. has added Conversational Remote Job Entry (CRJE) to its Infonet time-sharing service. With this tool, the user is said to be able to develop and execute his own program through a low-speed terminal. If the volume of output dictates, he can signal the CPU to put his results out on a high-speed printer either at Infonet or at his own site. With CRJE, the user can use Fortran, Cobol or Assembly Language, an Infonet spokesman said.

IBM's Service Bureau Corp. (SBC) made its second appearance as an exhibitor at a joint computer conference to introduce Mini-Mis, an information retrieval and report generator package available through the SBC time-share network.

United Computing Systems was showing Unidata, which the company described as a comprehensive, interactive data management system, and Unimis, a modular management information service. Both of these have been integrated into the company's time-sharing remote batch network.

Most spectacular of the systems measurement pitches was the Comress skit on behalf of "super-scert," for determining the effectiveness of CPU utilization.

Hardware Monitor

Known more formally as the Dynaprobe/Dynapar system, this product utilizes a hardware monitor (the Dynaprobe) to record computer performance activity which is then reported in histogram format by the Dynapar portion of the package. The completeness of this system is suggested by the listing of some 27 separate events that can be monitored by Dynaprobe.

Computer Management Aids Corp. offered similar service, based on the Dolby Program Operator's Monitor, a hardware device shown for the first time. Software analysis of the monitor's findings completed the service.

Along with Configuration Utilization Evaluation and Problem Program Evaluator programs previously available, Boole and Babbage showed a data set optimizer (DSO) that analyzes read/write head movements and lists the optimal arrangement of data sets (records on disks) which is said to minimize head movement time.

Bankers bank on us. Shouldn't you?

Next time you're moving information, remember—no one knows more about moving it than the people who run the world's largest communications network.

AT&T

Two Resistors Split Prize For Best Paper

ATLANTIC CITY, N.J. – John Ankcorn and Robert Blaekader split the prize donated by IBM for the best paper presented at the Resistors technical sessions at the SJCC.

Ankcorn discussed his design for a medium-scale digital computer, and Blaekader was cited for his thoroughness of documentation on his work with Basic.

In all, seven papers were presented at the session. The authors of the papers ranged from 13 to 19 years old.

The Radically Emphatic Students Interested in Science, Technology, and Other Research Studies, a group of young people who like to hack with computers, was formed four years ago in Hopewell, N.J.

Carrier Heads Meet at SJCC

Communications Users Promised a Choice of Services

By Ronald A. Frank
CW Technical News Editor

ATLANTIC CITY, N.J. – In a meeting that could not have been held only a few short years ago, representatives of the American Telephone & Telegraph Co. and the Federal Communications Commission joined with non-Bell common carrier applicants to hold a panel session titled, "Data Common Carriers for the Seventies".

The panel was held Thursday as part of the technical program held with the SJCC.

Taking part in the session were James Rae, vice-president of engineering and planning for AT&T long lines department, Kelley Griffith of the FCC's Common Carrier Bureau, John Goeken, president of Microwave Communications Inc. (MCI), Edward Berg, vice-president of Data Transmission Co. (Datran), and Phillip Walker of the Department of Defense.

The session described the expected advancements in data communication that would be available to computer users in the seventies. It also dealt with the impact that new non-Bell specialized common carriers would have for communications users.

Veteran data experts among the several 100 at the session mused that a few short years ago, a discussion of communications would have included only representatives of Bell and the FCC since proposals such as MCI and Datran have filed were then still unthinkable.

In outlining plans of AT&T, Rae said that Bell has no intention of offering data processing services, although it does intend to expand its data transmission capabilities.

He said that by 1980, the Bell system expects to be handling 1.2 million voice-channel miles/year, and in order to meet the needs of computer data users, AT&T will be drawing on new technologies such as high capacity coaxial cables and waveguides.

Rae told the assembled conference delegates that the Bell Stystem has no plans to build a separate data communications network, since the use of advanced transmission methods used on the telephone network would ultimately give users lower communications costs. A separate network might raise costs, he implied.

He said that Bell was planning to utilize digital subcarriers on the telephone network in 1973 to create intercity digital transmission paths for both voice and data uses.

Digital subcarriers would initially be available only to private line users, he said.

Rae said the Picturephone services which are scheduled for limited introduction next year could also provide communications users with data facilities and Picturephone trunk lines could conceivably also handle data streams for computer data transmission.

Kelley Griffith, chief of the domestic rates division, common carrier bureau, of the FCC told the meeting that the commission's authorization to MCI to establish a St. Louis to Chicago microwave route paralleling Bell facilities was really not precedent-making, but the FCC had simply followed its established principles of providing common carrier services where a public need existed.

The commission has always allowed new carriers to enter a field when the service "can reasonably be expected to be productive/of public benefits and otherwise is technically and economically sound," he said.

Griffith mentioned another aspect of the MCI offering to data users was precedent making in that the FCC will order existing carriers to interconnect subscribers of specialized carriers like MCI.

These interconnection facilities or local loops have been one of the major question marks for computer data users.

The MCI microwave links will be of limited use unless subscribers can obtain direct connection to the facilities. Apparently the FCC will now order the carriers to offer the required connecting arrangements.

When questioned on the point, Rae of AT&T told CW that local Bell companies would connect subscribers to the MCI St. Louis to Chicago link as long as they did not intend to transmit data beyond the limits of the two cities. Observers interpreted Rae's statement to mean that Bell might refuse to connect a computer data subscriber to an MCI (or other non-Bell) carrier if the data user intended to combine Bell and non-Bell data links for point-to-point transmission.

John Goeken, President of MCI, reviewed the six-year legal struggle that culminated in FCC approval for the first MCI link last August. He said that the decision would "open up a whole new era for communications in the 70's."

Goeken said the MCI concept differs from the proposed network filed by Datran, calling the latter a different concept, with a different approach and a different market.

MCI services would be attractive to smaller data users, he said, since half-time rates and limited usage discounts for off-peak hours would be included in the company's rate structure. Shared-channel usage by small subscribers would also be possible.

Goeken believes the competition planned by MCI, Datran, and others would benefit computer data users as well as Bell, since the telephone companies would be spurred into increasing their expanson of data transmission services.

End-to-End Service

Data users should have a choice of several carriers services to best suit their needs, he indicated.

Speaking for Datran, Edward Berg, vice-president said his firm would provide end-to-end service primarily for large data users. He said the network would initially serve 35 major geographic areas with provision for later expansion to 52 cities.

Berg said that subscribers to the Datran network would be required to rent an interconnecting device called a digital communications console (DCC) for about $15 per month.

The Datran network would be compatible with satellite communication systems when this type of service becomes available to computer data users.

Philip Walker, of the Department of Defense countered the predictions of the other speakers by pointing out that present data users still have only limited facilities to select.

Some independent telephone companies cannot even provide teletypewriter capabilities to prospective users, and the proposals put forth by AT&T, MCI, and Datran do not offer "an overnight solution for data users," he said.

Walker said, he predicted that despite AT&T's claims, communication charges would drop slowly because of the large financial investment required to expand Bell's data transmission facilities.

The panel session was moderated by Stuart Mathison, of Arthur D. Little.

Limitations in Graphic Art

Humanists Computerize Methods

ATLANTIC CITY, N.J. – Artists and scientists presented various views on the current state of computerization of humanities during a Wednesday afternoon session at SJCC.

Dr. Herbert Donow, University of Iowa, explained his work in stylistically analyzing the sonnett.

He has computerized a method of classifying lines of poetry with respect to rhythmical features, and says this can be applied to prose.

"There is no way of abstracting literature as there is no way of abstracting life, but certain graphic things can be pointed out," Donow stated.

A Princeton professor stated that fellow historians "now accept computers as tools of historical analysis.

Dr. Sheldon Hackney has been using quantitative techniques, for his History of the South, since 1945. He nonetheless said that computers have not yet revolutionized the field of history.

Music, Visual Art

Raymond Erickson of Yale sees applications in music–in composition and sound synthesis, analysis of sound, bibliographic control, and in thematic indices.

He sees little use in writing programs to create music or simulate scores.

The main problem in music analysis is representing music in machine-readable form, said Erickson. Map, P1/1, and Snobol are used often in musicology, he said.

The universal language used is Ford-Columbia Language, "Darms," which is suitable for any music after the Renaissance, he said.

Erickson has spent four years working for a method, and programming support, for musical analysis. He said he wants his colleagues to think less about method, and more about music.

Dr. Edward Arthurs of Bell Laboratories, has developed a program called Picturelab, to provide an interactive environment for research in picture processing, and to perform research in structuring systems for projects requiring large data arrays.

"We can't get off the ground in analyzing visual art with the computer," said A. Michael Noll, also of Bell Labs.

He indicated that pattern recognition has not been developed sufficiently to aid in analysis and classification of works of art.

Man-Machine Interface Progress: Managers Prefer Computer Help

ATLANTIC CITY, N.J. – The man-machine interface is now only slightly analogous to the weather, since progress is now being made in some areas of interaction between man and the computer.

Time was when everyone was talking about the man-machine interface as a looming, insoluble problem and, until the advent of display terminals in industry, nobody was doing anything about it.

Now, according to a comparative study of terminals used in management decision making, many supervisors prefer the flexibility and speed of display terminals to typewriter terminals and, of course, to scheduling by pencil and paper.

The study was presented by C.H. Jones of Harvard, J.L. Hughes of the IBM Education Center, and K.J. Engvold, also of IBM, who delivered the presentation.

Engvold said the study proved interactive terminals can "enhance" the decision-making process for managers.

One paper entitled "An Interactive Keyboard for Man-Computer Communication," was prepared by Richard C. Dorf, of Ohio University, and Larry L. Wear, of Hewlitt-Packard, who presented the paper.

Wear noted that people who have "little or no programming experience are becoming computer users," with the advent of time-sharing and remote terminals. He described a word-oriented-terminal that has two other advantages over the teletypewriter or similar entry device.

Wear said these features were error prevention in the form of "electrical lockout of keys" that could cause syntax error, and visual feedback, in the form of lights under keys, supposedly resulting in proper syntax generation.

He said an experiment using the Hewlett-Packard 9500A programmable checkout system proved the system to be 23% faster than that of a standard teletypewriter.

Applications in Graphics

One area in which the man-machine interface has progressed is interactive graphics. J.A. Turner and G.J. Ritchie described a new method of input and output for graphic terminals.

The authors, both of the University of Essex in Colchester, England, described a "new method of obtaining (X,Y) coordinate position information by means of linear current division in a restive area."

They said that their system provides high accuracy, simplicity in concept and construction, and fast coordinate sampling rate.

The fourth paper pertained to "Remote Terminal Character Stream Processing in Multics," a general purpose time-sharing system.

J.F. Ossanna of Bell Laboratories, and J.J. Saltzer of MIT authored the paper, which was intended to describe system design and human engineering considerations for such processing.

The paper described terminal excape conventions, single character editing, and canonical reduction of input text for the Multics system.

Panelists Report Work on Arpa DP Network

ATLANTIC CITY, N.J. – A nationwide computer network that allows users access to the programs and files of any of the machines in the hookup was the subject of one of the technical panels at the SJCC.

The communication medium is 50 kbit land lines.

The moderator of the panel, Dr. Lawrence G. Roberts of Arpa, emphasized that the significance of the project was its ability to let the processes of one computer facility "utilize the processes and data in other computers." He cited the example of a network user solving his matrices on the Illiac-IV without programming the Illiac.

Roberts said work on the transmission and interfacing was well along, but that the requisite software was still in a much more experimental stage.

SJCC Panelists Agree

Users Must Organize to Survive Unbundling

By Edward J. Bride
CW Staff Writer

ATLANTIC CITY, N.J. – Users must organize into strong, cooperative societies if they expect to survive in the unbundled environment, according to a variety of experts from all aspects of the computer community.

Several SJCC speakers, including Dr. H.R.J. Grosch, director of the computer center at the National Bureau of Standards, called on users to follow the example set by European groups. The British Computer Society, according to Grosch, has almost five members for every computer installed in England.

Grosch said that the Association for Computing Machinery has only one member for each three computers installed in this country. He made his remarks at a Wednesday morning session entitled "Lessons of the Sixties."

In an afternoon meeting called "Son of Separate Pricing," several industry representatives, all former IBM employees, said that unbundling was successful for the company because, as one put it, "Users are the most poorly organized and least able to unify" of all groups in the data processing community.

Lester M. Gottlieb, now with Data Dimension, Inc., said that the medium-size user would be most adversely affected by unbundling.

He added that some large users might actually benefit from the concurrent 3% price reduction because they, the large users, had not availed themselves of free software before unbundling.

Roy S. Dickson, a former chairman of Guide, agreed with Gottlieb that users are still poorly organized.

Dickson, representing Phillips Petroleum on the user panel which cross-examined the industry panel, also stated that much of the industry was forced into "arbitrary cuts" in DP budgets by the recession.

Dickson said that some management does not understand and therefore cannot control data processing departments.

He said that the lack of control and the non-expansion mood created by the recession had forced these "arbitrary cuts."

"Throw Out a Tape Drive"

Philip H. Dorn, president of Share, agreed that the recession was forcing budget cuts.

Dorn, representing Union Carbide, said that if he had to buy a program from IBM, his company might first "throw out a tape drive and replace it with a plug-to-plug compatible" unit to save money.

He also estimated that unbundling would cost some users an increase of 12%-15% over their previous DP budgets unless they took economy measures. He suggested equipment replacement as one such measure.

"IBM Calls SE a Salesman"

Gottlieb suggested that IBM was solving the problem of what-to-do-with systems engineers with semantics: "calling the SE a salesman." He added that the total demand for SE services will decrease, now that they are no longer free.

He said that unbundling should be beneficial for almost everyone, but that it would not be because the competing SEs and software houses were so "inept" at their trade.

Some of the others agreed, but insisted that the advantages of competitive software will someday be realized. "In the meantime," said David E. Ferguson, "it is premature" to try to assess the true impact of unbundling.

Ferguson, representing Programmatics, Inc., holds one of the few software patents.

Attorney Robert P. Bigelow said a new form of software protection is needed, since neither patents nor copyrights appear to give adequate protection.

Citing the history of unbundling with the associated anti-trust suits, he pointed out the dilemma of the most recent case.

In the suit filed by Howard Levin on behalf of Levin-Townsend [CW, April, 29], Levin alleges that the bundled position constituted illegal tie-in sales, but also that unbundling removed free support, Bigelow said.

The Boston lawyer also noted that in recent years 80% of challenged patents were judged invalid.

General Contractor

Dr. Wayne Swift of Computer Sciences Corp. said that overall supervision is needed when planning a multivendor installation.

He foresaw a new profession on the horizon: the "general contractor" for computer installations who, to confuse matters even further, might eventually be called a "systems engineer."

Looking to the educational aspects of unbundling, the former director of an IBM education center said that IBM is achieving a "complete monopoly" in that market.

George Ravazzolo, representing Advance Systems, Inc., said that this monopoly "bodes ill" for the entire DP education industry since IBM would be able to establish a pricing policy as high as "what the market will bear."

Ravazzolo also said that the recession is making people leary of job-jumping, and this is reducing the need for training.

He suggested that it would take "just a little more training" to have in-house personnel qualified to work on IBM systems.

Ravazzolo expressed concern that there has been no development of competition in this market. He said that no meaningful company has entered the field, although many have tried half-heartedly and failed.

Managers Can't Manage

Echoing sentiments of the "Lessons of the Sixties" panel, the unbundling panel agreed that many DP managers are not adequately managing their departments.

Robert H. Davis of American Express and chairman of a Guide task force on unbundling, said that management education has "all the aspects of another conversion" like the one from second to third generations of equipment.

Dickson added that Share and Guide must pave the way in this direction.

Peter Dawson, representing United Artists Corp. as a major IBM user, said that unbundling had taken away the "security blanket" of free support, and that better management must result.

Ann Marie Lamb, management analyst for the Bureau of the Budget, foresaw more multivendor installations as the direct result of unbundling.

Although there was little time for audience participation in this discussion, Martin Goetz of Applied Data Research claimed the small software houses could offer better response to user problems.

Goetz said that a small house with "one or two programs" would be better equipped to answer a 2 a.m. trouble call.

Dick Jones, former president of ADR, suggested that unbundling is not expensive because programming costs and operating costs could be reduced with certain proprietary packages.

There was no immediate response from either the user panel or the industry panel, although Dorn later countered that more money could be saved with hardware exchanges. He concluded that "better software delivered late doesn't save a thing."

Lower Cost 2314 Replacements Shown by U.S., Japanese Firms

ATLANTIC CITY, N.J. – Several independent peripheral manufacturers displayed plug-to-plug compatible replacements for the IBM 2314 disk drive at the SJCC.

Six manufacturers offered their substitutes for the IBM large-scale random storage system. They were: Marshall Data Systems, Telex Computer Products, Peripherals General, Inc., California Computer Products, Inc., Potter Instrument Co., Inc., and Hitachi, Ltd.

Lower Cost

The units are said to uniformly provide performance levels as good or better than that of the IBM system they replace at a lower cost. Reduced access times represent the increase in performance and are obtained through the substitution of voice-coil type actuators in place of the hydraulic incremental system used by IBM.

Those firms that have adopted this newer actuating mechanism deny that the electromagnetic fields set up by the mechanism itself can have a harmful effect on the integrity of the data stored on the disk. To prevent a field from acting on data, the manufacturers of these units have installed shielding between the actuator and the disk, reducing the EM field by about two-thirds.

A point in common with all suppliers of the 2314-compatible systems is the exact plug-to-plug replacement for the IBM controller. Uniformly, all makers say that their devices feature complete compatibility with the IBM device and lower prices.

Another significant area of improvement has been the reduction of time required to bring a disk to operating speed and to slow it to a stop. Although varying from manufacturer to manufacturer, almost all the independently produced drives offer time frames that represent an improvement over those of the IBM drives. This generally results in shorter interrupt times for changing disk packs.

All of the drives use the IBM 2316, or equivalent, 11-high 20 surface disk pack with a capacity of 233.4 million bytes per system or 29 million bytes per pack. Rotational speeds of 2,400 rpm and data formats are identical with that of the IBM system, enabling the user to switch to the independently manufactured system without modifying either his software or his data.

Although total capacity of the independent systems is identical with that of the IBM system, the non-IBM systems offer more flexibility in the configuration of the drive.

IBM and Hitachi users must add on-line drives in increments of two, four, or eight with a ninth available as a spare; the others can attach from one through nine units.

'Implications' Session Again Called 'Irrelevant'

ATLANTIC CITY, N.J. – "The SJCC should have cancelled technical sessions and replaced them with discussions on the national crises," was one reaction to an afternoon session at the conference last week.

The session on "Social Implications" turned out to be a presentation of just two views on the "invasion of privacy."

The relatively calm remarks of Prof. O.E. Dial of Baruch College and L. John Rankin of IBM sparked the emotions of an audience apparently aroused by recent national events.

Two other speakers, plus the panel moderator, were not present for the discussion. Amoung the missing were Michael Maccoby, of the Institute of Policy Studies, Leonard Rodberg, of the University of Maryland, and the moderator, Dr. James W. Ramey, of Drexel University.

Ramey was a member of last spring's "Social Implications" panel, which was disrupted by the Computer Professionals for Peace (CPP).

Edward Elkind, co-chairman of CPP, called this year's panel "totally irrelevant." He said that possible constructive applications of computers were not even mentioned.

Audience Reaction

A user in the banking industry encouraged donation of business and government computer time for social use.

An employee of the computer center at Baruch College suggested making houses or anti-smog devices instead of spending federal money on bullets for target practice.

A CPP member echoed findings of other panels, stating, "hardware has been the success in the last 10 years, and the people the failures."

The peace group member added that "the manufacturer only responds to what the user demands." The member thus aligned himself, perhaps unwittingly, with the stated IBM position that a manufacturer cannot dictate the use of equipment by the purchasers of that equipment.

Privacy Issue

Dial suggested that the privacy invasion is counterbalanced by society's need to know.

Rankin disagreed, stating, "Privacy is highly important because it is essential for the common individual to get away from the pressure of society."

He added, "The most precious of all human rights is the right to be alone."

"Security must be built into the systems and be relevant to applications," said Rankin. "The questions are: what might be put into the machine, and what might be in it to harm the individual, and who has access to it."

Rankin continued, "With security, we have only ameliorated the question. The question is: what is data for, and why was it collected."

He called for a new public attitude of "Do I need to give information?" instead of giving the asker more than he seeks, which can lead to requests for more information.

Rankin concluded that the computer industry is probably more capable than any other industry of informing the public about privacy.

Editorials

Maximum Security Required

Many companies seem to think of their computer centers as simply modern versions of the old file-storage areas.

This means that the computers and data files effectively have no protection at all.

Old-fashioned file-storage areas had a form of automatic protection. The files were too bulky to cart away easily. And so few people had any interest in going into the filing area that strangers were almost certain to be noticed.

Conditions in a computer center are exactly the opposite. A reel of tape containing a huge block of files can be carried away under someone's coat, copied within a short time, and returned unnoticed. And computer centers attract so many visitors and employees that no one pays much attention to people wandering around the installation.

Because computer centers are so valuable – and so vulnerable – they should be treated like bank vaults, not file-storage areas.

They should be locked from the outside, and no one should be admitted without first showing proper authorization.

If management considers the center a showplace, one or more walls of the center should be made of bullet-proof glass. Visitors should be kept on the outside.

As further protection, duplicate copies of all software and key files should be kept under lock somewhere removed from the center, so that if the worst happens, the installation can recover easily.

Such precautions would not only protect the center from minor problems but would also prevent incidents such as the one at Sir George Williams University [CW, April 29].

'All Right, the Fun's Over···Get Back to Work!'

Letters to the Editor

Most Programmers Underpaid, Overworked, Fear Job Loss

Like Messrs. AuFrance and Samhammer before me, I, too, am slightly turned off by the recent flippancies of Dick Brandon and Dr. Richard W. Hamming, not the least so because I know well that they're old enough, experienced enough, and wise enough to know better.

Of Brandon's statements that " . . . there are plenty of jobs (and) . . . There is no economic pressure, and no fear about losing a job . . . ," I doubt that this is true along this part of the West Coast and seldom true throughout any of the Midwest and Southwest. (Recently, over a thousand highly experienced programmers were layed off in one western city alone, in less than 90 days.) There are *not* plenty of jobs; there *is* justified fear about losing a job, there is a helluva lot of economic pressure, there has been for some time, there will continue to be. These are rough times, and getting rougher. Consequently, *most* programmers I've known and met – since I'm active in ACM chapters, and my work keeps me travelling much, in many parts of our land – while already *non-myopic, literate*, overworked and underpaid, are improving, when and where they can, despite anyone's jeremiads.

Incidentally, Dick Hamming's suggestion about "Double or Nothing" contracts has real merit – I only hope federal legislation requires AT&T to give its users similar aid and financial comfort in these 10 years during which he expects to see us disappear.

More seriously, I hope that anyone attempting to become a professional programmer (and/or eschew professional obsolescence) reads a justifiably famous essay, "One Man's View of Computer Science" [by Richard Hamming, *Journal of the ACM*, January, 1969].

The advice there given us *is* well worth taking: I suggest further that it's because some of us were lax in paying attention to sage advice and wise counsel that anyone would now take these interesting, if somewhat overreactionary, remarks seriously.

Daniel F. O'Connell
Independent Consultant

Palo Alto, Calif.

Not All Programmers Deserve Condemnation

In reading the April 8 issue, I was shocked by the article in which Dr. Richard W. Hamming of Bell Telephone Laboratories handed down that slanderous attack on the programming profession. I would be the first to admit that much of Dr. Hamming's statements are true, but to condemn every person that beholds the title of programmer or other related function is, in my opinion, both ignorant and imprudent.

It might come as a surprise, Dr. Hamming, that maybe, just maybe, there are one or two competent people in the profession who do take pride in their work.

I am sure that I speak for many in saying that Dr. Richard W. Hamming's remarks were personally offending and degrading to the profession.

Conrad G. Davis
Programmer

Honeywell Inc.
Data Products Division
San Diego, Calif.

Time-Sharing Service List Not Entirely Accurate

On page 7 of the Time-Sharing Supplement [CW, March 25] you listed time-share prices for the First National Bank of Memphis which were in error. For the record, our time-share price structure is as follows:

Connect time per hour – $7.
CPU time per second – 4 cents.
Mass storage per 1,000 characters – $1.50.

I would like to point out that we do not offer at this time Cobol on our time-share application.

May I compliment you and your staff on a well organized and written supplement.

Ben F. Whitten, Jr.
Automation Division Sales Manager
First National Bank of Memphis
Memphis, Tenn.

The table of time-sharing services was prepared from the best available information but apparently was not up to date with the volatile industry it covered. While the table served its purpose of giving readers an overview of the services available, anyone planning to act on data in the table should also note that not all companies were listed and that many services offer cost-cutting inducements such as certain amounts of free time or free storage. Ed.

Spelling Errors Clouded Issue

Re "Blame the Computor" [CW, March 11], it would seem that the receipient (sic) of computor (sic) prepared invoices has more than one cause for complaining about spelling.

John M. Jeglic
Manager, Design Automation

Keystone Computer Associates, Inc.
Fort Washington, Pa.

The spelling errors (both theirs and ours) unfortunately clouded the point of the story – that the company was blaming errors on the computer. Ed.

Using Our New Data to Increase Throughput

Earlier in these Taylor Reports attention has been drawn to two areas involved in obtaining improved throughput from computer systems. The two areas involved are called the "Wastage Area" and the "First Cascade Area." Both are defined by listing the percentage utilization of the two most-used units of a particular computer run, which are called respectively the Dominant and Next-to-Dominant Units.

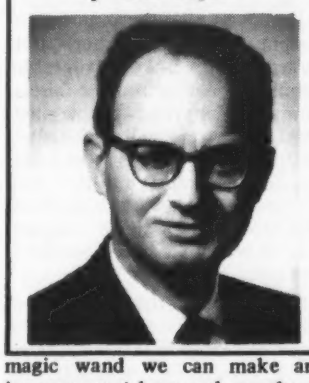
The Wastage Area is the percentage during which the Dominant Unit is NOT working, and is found by subtracting the percentage utilization of the Dominant Unit from 100%.

The First Cascade Area is the percentage which separates the usage of the Dominant Area from that of the Next-To-Dominant. This is found by subtracting the percentage utilization of the Next-To-Dominant from that of the Dominant.

Both these areas are considered to be key targets for improving throughput operations. (Copies of the earlier reports can be obtained from Alan Taylor.)

The Taylor Report

by Alan Taylor



Now it is wonderful to be able to say that some parts of the program do not have to be worried about, and to identify two particular parts are definitely worthy of attention. This is data that we have never really had available before when we wanted to attack the throughput problem. The lack of this data often meant that throughput has not been very well optimized.

But there is still something else necessary before we can really claim that computer efficiency performance is even approaching being a science as opposed to being an art. Admittedly we have knocked down the number of items that need attention from 20 possibilities and are now able to concentrate on two.

We should – if we are being scientific – be able to decide which of these two is the most important. That is to say we should be able to concentrate our attention on a single case.

Before we can do that, however, we have got to understand the characteristics of the wastage and the first cascade areas – their similarities and differences.

First Cascade Characteristics

This study of the wastage and first cascade areas can be restricted to considering the differences involved in how to improve things in the two cases. Improvement, after all is the goal. This simplifies our task.

Taking the first cascade area first, and assuming that by some magic wand we can make an improvement here and somehow reduce the first cascade, what type of attention would occur?

Let us take a hypothetical instance. Let us assume that we have a central processor dominated run that is working at a processor percentage efficiency of 80% and that the first cascade has a height of 30%. (i.e. nothing else is working more than 50% – Figure 1). Now translating this into figures, this means that in an elapsed time of 100 minutes the processor was not working for 20 minutes and no other unit was working for more than 50 minutes.

Now our aim is to save some of the first cascade, that is some of the 30 minutes that the processor was working more than any other unit. The way we attack is clearly by trying to reduce the amount of time the processor is taking.

Again, using that magic wand, let us assume that we have cut the central processor time used by 25%. This means that the processor is now going to do in 60 minutes what it was doing in 100 minutes. What affect will this have?

Throughput Improves!

The effect is shown in Figure 2. To construct this we have assumed that the amount of wastage is exactly the same as before, that is to say 20 minutes. Now the central processor time is down to 60 minutes, so that total time is 80 minutes as opposed to the previous 100 minutes. The processor percentage is now reduced – not increased. It is 75%! The card reader percentage will of course be increased because the card reader will still be used for 50 minutes which will be now 62% total.

But the 20-minute wastage now represents 25% of the area – not just 20%!

To summarize, by reducing the central processor time we have reduced the cascade and the total time for the program. The figures are that we reduced the processor time by 25%, we increased the throughput by 20%, and we reduced the first cascade from 30% down to 13%.

Alan Taylor, consultant, writer, and former editor of *Computerworld*, is president of Computer Management Aids Corp. of Framingham, Mass.

This has been done by altering the productivity of only one item – in this case the central processor. No other change was made. From this it can be seen that the characteristic of obtaining profit from measurement in the first cascade area is "Singularity" – only one item (the dominant one) has to be attended to.

The other potential area where profits can easily be extracted is the wastage area. It has its own characteristics also – of which potential gold prospectors should be aware. We will be looking at this soon.

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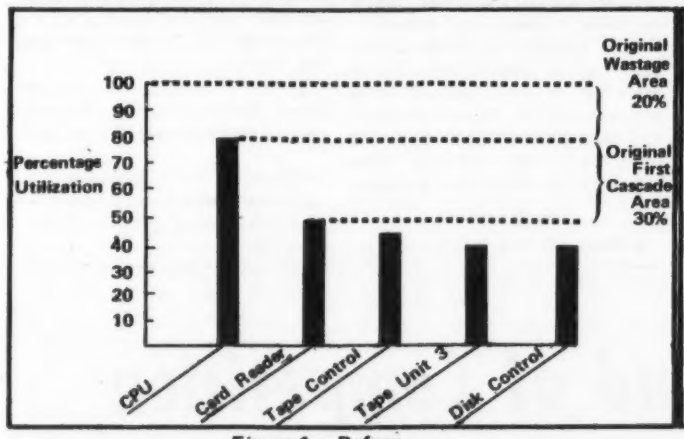

Figure 1 – Before

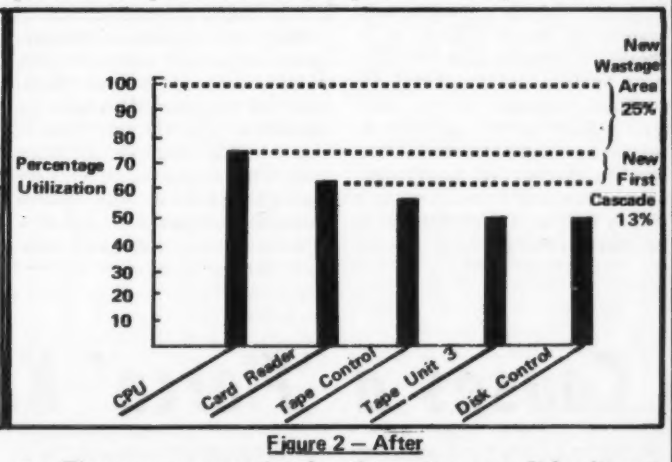

Figure 2 – After

Letters to the Editor

APL Will Set Direction For Future Languages

In his article, "APL – A Complex or Simple Language?" [CW, April 1], Alan Taylor takes the position that APL can be either simple or complex, depending upon the method of approach. I would like to support his claim with some fact and fantasy.

For the past year, I have been using a version of APL to test out various algorithms relating to my work and favor it far above any of the other time-sharing systems available to me. About six months ago, I gave a copy of an APL Primer to two of our high school cooperative students, told them to look it over, which they did not, and then showed them how to dial-up and log into the system. Now I find that I have to come in early in order to be able to use my own log-in identification; moreover, they are not coming around as much to ask questions. My own conclusion is that anyone with enough fortitude to call up the APL System can learn the language.

Taylor mentions the complicated APL character set and the APL operators as a concept, but neglects to relate this to APL's low level of acceptance by the programming community. I find that even the most confident and experienced Fortran, Cobol, or PL/1 programmer will tend to shy away from APL just because the character set is different; consequently, he does not even bother to understand the underlying concepts of the language. Some of these new concepts are:

- There are no statement verbs, only functions and expression operators, thus allowing an expression to be as simple or as complex as the programmers interpretation of the language.
- There is right-to-left execution of expression with no operator precedence rules, except for parenthetical subexpressions.
- There are no programs in the APL language, only functions.
- Function execution may be completely conversational; that is, the APL language has been constructed within a time-sharing system with interactive, incremental execution.

APL has continued, and in my opinion, will continue to gather momentum, but only as a secondary programming language. Although it is a very difficult task to get an experienced programmer to change to a new language, I am certain that it is undoubtedly easier to get him to use APL as a second language to enhance the functional capabilities of the one he knows best. That is, APL is more apt to be used on-line to debug an algorithm which will then be transposed into the user's primary programming language. This type of approach can and will reduce the total develment time necessary for the finished program, no matter what the primary programming language.

In my opinion as an enthusiastic user, APL will set the direction for future programming languages.

Kenneth M. Gilbert

East Rockaway, N.Y.

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A Look at Systems Analysts — Part I

It's Ability That Counts, Not How Much Experience

By Milton C. Spett
Special to Computerworld

The term "EDP systems analyst" is commonly used to describe one or more of the following functions:

Business analysis – This includes identifying problem areas, learning the functions performed by operating departments, determining which system will produce the greatest benefit/cost ratio, gaining the confidence and involvement of user departments, etc.

Computer analysis – This includes dividing a system into a series of computer programs diagramming the logic of the computer programs, defining files, transactions, controls, writing specifications, etc.

Computer programming – This includes the coding, testing, and debugging of computer programs. In many companies "systems analysts" perform these functions.

In many companies the business analysis is not done by the data processing department but is given to them by the using department. The "systems analysts" then do the computer anaysis while the programmers handle the computer programming. This is a dangerous practice because using departments lack the following qualifications for business systems analysis:

1. They are usually so involved with day-to-day problems and crises that they do not have time for the careful, throughtful analysis that is required.

2. Their lack of experience in the design of data processing systems will cause them to overlook input editing, human factors, and other subtle systems requirements.

3. Their familiarity and identification with current business practices will bias them against significant change.

A qualified systems analyst, however, will have the time, the experience and the unbiased viewpoint that are so important to the development of successful EDP systems.

Faulty Business Analysis

For even if the quality of the computer analysis and programming are excellent, faulty business analysis will cause any system to be a failure. It is therefore essential that the business analysis is performed by qualified business systems analysts, subject to the approval of the using department. If the systems analysts are knowledgeable in systems techniques, and if they become knowledgeable in business problems, they will be fully qualified to handle the business analysis stage of EDP projects.

A serious problem, however, is that most companies do not look for good systems analysts. Rather they wait until they have a specific project that must be done and then, under heavy pressure, they search for a man who has the "right experience," rather than exceptional ability. Various types of "experience" are generally considered desirable:

Business area experience – If an order entry system is to be designed, order entry experience is considered desirable. It is assumed that the experience gained on the previous assignment will be valuable on the new assignment. In fact, the opposite is true.

Viewpoint

What was learned on the previous assignment will have been overlearned and the new situation will be assumed to be more similar to the old one than it really is. Therefore the solutions that worked previously will be overgeneralized and indiscriminately applied to the new situation, frequently with serious consequences.

The unbiased outlook of a talented systems analyst who is new to a particular business area is far more likely to be successful. This is similar to our jury system in which not experts, but completely unknowledgeable people are considered the fairest jurors. It is sometimes argued that extra time will be needed for the systems analyst to learn the business area, but it is far better if he learns it as it really is and does not quickly assume that it is similar to his previous company.

Industry experience – Experience in the same industry, such as retail selling, insurance, etc. is often considered desirable. In fact, such experience is irrelevant to success in systems analysis.

Computer experience – The want ads also frequently ask for systems analysts who are familiar with a particular manufacturer's equipment. Such experience is, of course, totally irrelevant to the success of a systems analyst. Many outstanding systems have been designed by analysts who had only slight exposure to computer systems.

New Horizons

Behind all this desire for experience in systems analysts is the assumption that if he has already done it once, he will certainly be able to do it agin, and he will do it better the second time. But this reasoning ignores the fact that anyone with the drive and imagination to be a successful systems analyst will not want to do the same thing twice. He will want to go on to new areas and new challenges. The man who wishes to remain in a familiar area has lost the innovative drive which is so essential to the systems analyst.

What really counts in a systems analyst is not experience but ability. As long as there are some members of the EDP department who have experience in the design of large-scale business systems, this experience can be easily passed along to any newcomer in a relatively short time. But no matter how much experience he has, the man who lacks the necessary abilities will have a far more difficult time developing them.

The next article will describe those abilities required for successful business systems analysis.

Milton C. Spett is manager of data processing for the Industrial Gas Division of the Air Reduction Co.

Art Strickland

Unbundling Causes a 'Fierce' Kind of Competition

In recent years, the computer business has been, as we all know, "fiercely competitive." Ever since the stock-buying public realized that IBMs are made, not born, dozens of salesmen have assaulted the computer-buying public, fiercely to take them to lunch, or better yet, to buy them a fierce drink.

Your IBM salesman even started taking you to lunch and – we never thought we'd see it – buy you a drink. And – he never thought he'd see it – have one with you! (Tom Watson would flip to 12-edge face up.)

But there was recently a curious turn of events in this regard. Fortunately it didn't last, but it should be noted, if for no other reason, than to build some lore for future generations. (Sellwyn Gruber brought this phenomenon to my attention, but I'll tell it in the first person to avoid all those single quotes (so you won't confuse my remarks with Hollerith literals).)

"Yes, chief?" I asked at my boss's doorway.

"Come in, Art. We've got a problem I think you're the man to handle." He had a deep furrow in his brow.

"Well, I'll certainly try, Burt." I could see from the tooth marks on his pencil that we were in trouble. He chews his pencils a lot, but this one was a Scripto.

"What do you know about mutally planned support?" he asked, up on his elbows.

Last of IBM Freebies

"That's the last of the freebies from IBM, right?"

"Wrong," he bellowed. "It's the little tug they're giving before they pull the rug out from under us! At least that's what we have to say we think, because we've got to have more of it. Lots more!"

"I don't understand, Burt. Isn't it a little late mutually to plan support? Unless, of course, 'mutual' means you and me," I quipped.

"Strickland, you're using levity where it's not called for," he wheezed through clenched teeth. "We didn't plan it because we didn't think we needed to plan it. But we expected it. We're used to it. We're hooked on the stuff, dammit." He was beginning to turn red.

"Okay, Burt, I'm sorry." I paused while he collected himself. "I'll do everything I can."

"Well it has to be put in writing by next Thursday. I mean Sam Service has to submit a detailed list of it to IBM, complete with SE manhours. We've got to get those estimates up, Art. We've got to get some applications in that list we've never even discussed with Sam. It's a critical situation, Art. We can't stand the withdrawal symptoms, and I'm counting on you to see that we don't have to."

"I'll do everything I can," I repeated. "What can I do?"

"How well do you know Sam Service?"

"Well, I've talked to him several times. And when I was evaluating that Univac proposal last year he took me out to lunch a lot. I guess I know him better than most of our guys do," I mused.

"Exactly why I picked you. Besides, I think you have the personality for the job."

"Personality?"

Salesmanship

"Right. Art, what I need from you is salesmanship. Not just selling yourself this time. I mean some real belly-to-belly selling. We've got to make Sam Service love us. We've got to make him want to do business with us."

"I think I understand the objective, Burt, but how do I do it? I'm no salesman."

"You can do it, Art. It's easy. Think up excuses to call him, then bring up other subjects. Mention the advantages of having us for a customer. Talk about growth potential, about our vendor services. Tell him our story, man. If we don't, somebody else will!"

"Yeah, I get it. Tell him our story." I was getting a little excited. "But what if he won't see me? He's a busy man, you know."

"Well pressure him a little, Art. Hint that we're considering another 2314; ask him about the 195. If he won't come to you, go to him. Take him to lunch. Buy him a drink, for crissake!"

"Hmmm. By golly, it might work. Get him loosened up a little. Informal atmosphere. Hey, maybe he plays golf. I'll call him right now." I got up to go.

"Don't forget the reflective question," he called after me. "And always get agreement as you go along."

"What do you mean? What's a reflective question?"

"Here, you'd better read this book on salesmanship," which he whipped out of his credenza.

"Okay, I'll read it tonight, but I better call him now for an appointment."

"Hello, Sam, this is Art Strickland at General United, I mean United General. Sam, I was wondering if you could have lunch with me tomorrow. You see, our 2314 capacity is running out pretty fast and . . . you could? Wonderful. I'll make reservations for us at the Executive Club and pick you up about a quarter to twelve, okay? . . . Good. I'll see you then, and Sam? Thanks a million."

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Wyly Says Biggest Problem Is Transmission Bottleneck

By Drake Lundell
CW Staff Writer

ATLANTIC CITY, N.J. – A special task force to study the present and future of data communications was called for by Sam Wyly, chairman of University Computing Co., in the keynote speech at the Spring Joint Computer Conference here last week.

Wyly, whose firm may soon be involved in the data transmission business through its subsidiary, Data Transmission Co. (Datran), suggested to the press that the study could be financed by the computer manufacturers or other interested firms in the computer field.

Wyly urged that the study group be established by the American Federation of Information Processing Societies (Afips), which sponsors the semi-annual Joint Computer Conferences. He said that the task force should be composed of five to seven members and should be required to report to Afips at the Fall Joint Computer Conference in Houston, Texas.

Problems Cited

In his speech, reportedly prepared by Datran, Wyly said that the number one problem facing the computer community "is the bottleneck in data transmission." He further claimed that "the absence of reliable, high speed, low cost access to computers and data banks has led us to the brink of disaster."

At present, he stated, "we are confronted with a crisis in data transmission." If this industry crisis is not solved, Wyly promised, "it will lead to a national crisis. The crisis in data transmission will slow the growth of an economy which is now based on knowledge."

"In the computer industry," Wyly said, "we must accept the fact that we are a significant part of the telephone industry's problem, for the culprit which has upset the planned progress of the telephone industry is the computer."

The computer is responsible for the present situation, Wyly suggested, because its digital transmission has been imposed on a telephone network designed for voice communication and because "data demands a perfection of transmission that voices don't need."

In addition, Wyly said, no one predicted the explosion in data transmission that is now well underway. This problem, he said, was also compounded by the "staggering" growth in demand for voice communications that has called for "an all-out race to save major cities from overloads and breakdowns."

The real dilemma is how to accommodate both data and voice communications in the future, according to the UCC chairman. We must find out "how to stretch a voice-oriented plant into a data transmission plant, under pressure, and still charge rates that encourage–rather than inhibit–the national economy."

"It is no exaggeration to say that the future of the computer industry depends on the cost, quality, and quantity of data transmission," Wyly said. "Whatever slows the use of computers slows not just the sale of them, but the social and economic growth of all the businesses, of all the professions, indeed of all nations, that look to the computer as an incomparable instrument in human service," he added.

Present Situation

Presently, the computer industry needs communications that are "immediate, accessible, and universal," Wyly said. "These are the qualities that we seek in data transmission.

"But," he claimed, "the computer industry has received a busy signal" from the common carriers.

The industry must "take the initiative in demanding better data transmission service from the existing telephone and telegraph carriers. We must also take the initiative in seeking alternatives," he said.

Wyly predicted the "lion's share of data transmission traffic" will always be handled by the existing carriers, but said "their level of service must improve dramatically." The computer industry, as a major user and one of the causes of the problems, can help to get better service, Wyly said.

The computer industry "can serve as a catalyst to bring about urgently needed improvements." It "can define realistic service goals, establish a reasonable time limit for improved performance, and can keep pressure on the carriers until these are met," he added.

To do this, Wyly said the computer industry will need "a greater liaison with the telephone and telegraph companies to tell them what is needed and to make sure they are listening."

In addition, Wyly said, the computer industry should evaluate the alternatives that have been proposed to take some of the data transmission load off the carriers' backs. "These alternatives extend the industry's range of options" and will permit the realization of the full capabilities of computer technology.

The alternatives he listed include Datran, Microwave Communications Inc. (MCI), and the possible use of satellites in a domestic data transmission network.

SJCC Keynote Speaker Sam Wyly

Although these alternatives are available, Wyly said, "There is no alternative to action. There is no alternative to the computer industry's seeing itself from now on as the computer/communications industry. . . . All of us must accept the fact that size, speed, memory capacity, and software developments can grow only as far as data transmission will allow."

To overcome the problems, Wyly urged that the computer industry "accept with me the data transmission crisis as its major problem–the one door to future growth must be opened."

Secondly, he proposed the creation of a task force by Afips "to study the problem of data transmission, to work with existing carriers to overcome them, and to look into alternatives that can be pursued in parallel."

This task force "should not include representatives of either the existing carriers or companies which have proposed data transmission alternatives," according to Wyly.

"It should report to the industry at the Fall Joint Computer Conference and at subsequent conferences. It should serve as a clearing house of information on how severe our communications handicap is, on what is being done, and what needs to be done."

After defining the problem, and suggesting some avenues of action, the task force would report back to Afips for further action, Wyly told CW. The task force might have to become a permanent organization to make sure that its proposals receive a fair hearing, he added. But Wyly said he could not see that far ahead.

SJCC Panelist Calls for Cabinet Level EDP Post

By Michael Merritt
CW Staff Writer

ATLANTIC CITY, N.J. – Who would you recommend as the first U.S. secretary of communications and information?

A cabinet level office concerned with data processing and communications was one of the suggestions to come from an Afips panel called The Information Utility and Social Choice at the SJCC. The position was proposed by Professor M.A. Melkanoff of UCLA, one of the seven members of the panel discussion.

Melkanoff said that problems involved with information utilities have "reached a point very close to critical, within the next decade if not right now."

According to his proposal, the new department would study and keep guard over information utilities, standardize communication links, safeguard public interest concerning copyrights, privacy, including the use of data banks, and encourage the development of future information systems.

Much of the discussion centered around the communications bottleneck. Many of the panel agreed that current data transmission facilities will be completely inadequate to handle the inevitable needs of the coming decades.

The solution they recommended was to change from reliance on twisted-pair telephone lines to use of the coaxial cables of community antenna television systems (CATV). In the words of the moderator of the panel, Hal Sackman of System Development Corp., CATV is "the most promising communications highway into the American home."

Dr. Robert Dunlop, formerly manager of consumer data services for the Advanced Data Systems Division of IBM, and now with Logistics Distro-Data, Inc., pointed out that processing costs have been decreasing by 25% a year, while communication costs have been falling only 2% a year.

Dunlop said his work at IBM had shown that the most effective way to involve many people in interactive information systems was through the use of CRT displays. He said the CRTs were favored over other means, such as Selectric or Touch-Tone terminals. He said the use of CRTs increases the need for a coaxial system such as CATV.

Talking of the regulatory atmosphere surrounding information utilities, Lionel Kestenbaum, formerly of the Department of Justice, said that for the most part there are no federal laws regulating DP systems.

The FCC has incomplete authority over CATV systems, and has been traditionally concerned with aspects of communications that are unrelated to the problems that will come from information utilities, he said.

Kestenbaum concluded that the federal government will be "deeply involved" in these systems to meet its own needs, and yet has "no institutional mechanism to coordinate and regulate" them. He said that federal regulation can be expected if the industry fails to govern itself.

Speaking on the subject of the national data bank, Dr. E.S. Dunn Jr., of Resources for the Future, said he did not foresee one "all-purpose" information utility in the future, but rather a number of overlapping services, each centered around certain types of information.

"The romance of a massive integrated data file," with which a person "could instantaneously associate a bit with any other bit" had seduced both proponents and opponents of such a system into making "naive, oversimplified" claims, Dunn said. He cited the difficulty of designing such a system and the cost of using it as considerations neither side had viewed.

Dunn called for a new approach to the design of such a data bank–one that considers "the experimental and emerging process of design," rather than one that calls immediately for all the answers to the conflict of privacy and efficiency.

Edwin Parker of Stanford University spoke on the social-scientific aspects of a widely accessible information bank. Starting from the dictum that "information is power," he outlined the possibility of monopolization of information for the benefit of an elite.

He contrasted this with the possibility of a better informed public using an information utility to transfer power to the people. Parker cited the prediction that by 1985, 85% of the homes in the U.S. would be serviced by CATV.

Two possible dangers cited by Parker were inequitable distribution of information for geographical and economic reasons and shortage of educational content in any publicly financed cable system. "We will have information pollution on a grand scale if only the private economy is putting information into the utility," he said. He called for "lobbying for major government financing to bring benefits of computer technology to all the individuals of society."

The final speaker was Professor H. Borko of UCLA, who described an existing plan for a world science and information center.

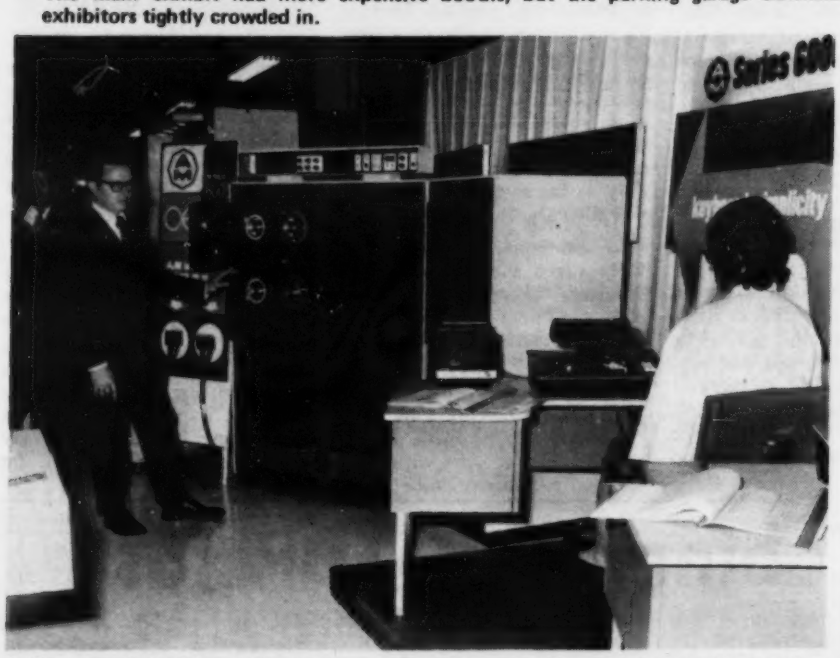
Sights at SJCC

The main exhibit had more expensive booths, but the parking garage downstairs had more exhibitors tightly crowded in.

Service Bureau Corp. highlighted its booth with gas-filled ballons.

CW Photo Feature

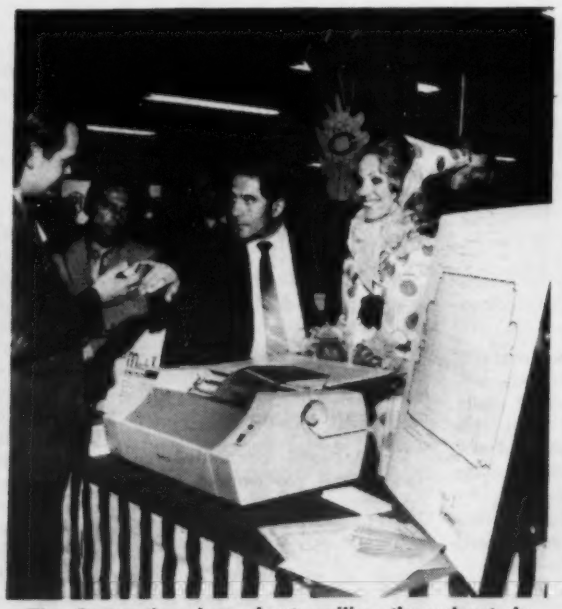
By V. J. Farmer, M. Upton



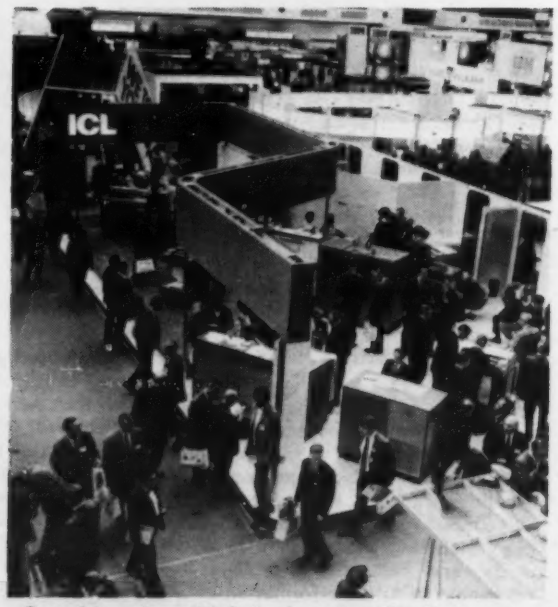
Addressograph-Multigraph broke from its tradition of demonstrating duplicators by setting up a four-station key to tape pooler.

NCR demonstrated an operating NCR 200 system.

Bit operated its own "Computer Store."

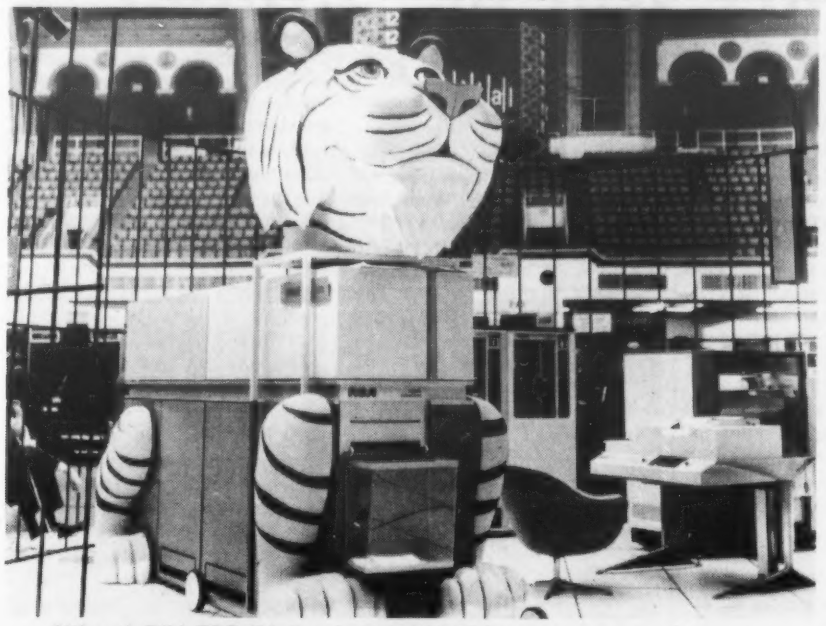


The Centronics clown kept smiling throughout detailed explanations of the Mach I Printer.

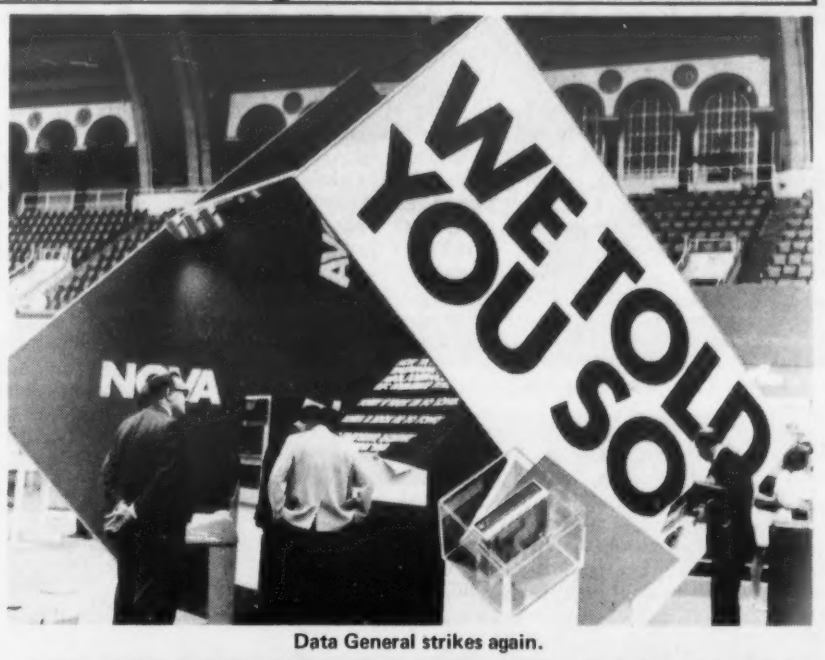


One thing they didn't have at the ICL display was Brooklyn accents.

Sights at SJCC



Although RCA EDP didn't make it, RCA's Videocomp came as a tiger.



Data General strikes again.

Compat gave its terminal a higher IQ with a magnetic tape magazine.

UCC operated in the enclosed mode.

ICL's Change-of-Pace Midi Girls

Ferroxcube's Moon Maid

Photophysics '45' keyboard CRT pushed out hard copy at the touch of the hand.

Redcor equipment got checked out.

Inforex Picky Processor

Lawyer Tells Session

Enforcing Software Patents Will Be Difficult

By Edward J. Bride
CW Staff Writer

ATLANTIC CITY, N.J. – Enforcement problems and damage assessment difficulties are ahead for those who succeed in obtaining software patents, a prominent lawyer said at the Patents and Copyrights Session conducted at the SJCC.

Lawrence I. Lerner said that enforcement problems arise from an apparent lack of jurisdiction since a "complete act of infringement" is needed for conviction.

The problem is not prominent with small- or medium-size users who have all their computing capability in one location or one state. Larger users, however, who enter data from one state to a processor in another state, may escape patent infringement litigation until more definite laws are written.

Lerner said that international law is also needed to cover the possibility of a Detroit-Ontario network, for example, which might infringe a Canadian or an American patent.

Lerner also cited the difficulty of appraising damages caused by infringement, or the problems of determining an appropriate royalty for a license of a computer program.

He suggested that an arbitrary percentage of the value of the computer might be used as a royalty fee until a better way of assessing the true value of a license could be determined.

The session was conducted by Howard R. Popper of Bell Telephone Laboratories. Popper was one of the Bell attorneys who successfully pursued a software patent appeal in court.

The subject of their patent application was a communications device which synchronized bit streams. The patent was given to John Mahony, the inventor, and assigned to the Bell Labs.

Program Patent History

Popper reviewed the history of software patents, which originated with the celebrated *Prater-Wei* case. Although this case involved an analog computer to analyze gases, it established precedent for programmers attempting to obtain compensation and protection for their efforts.

Bernhart-Fetter was next, and the applicant, Gordon Sanborn, was also a panelist.

The Patent Office objected to the *Bernhart-Fetter* application on the ground that the process was merely a mental one. The subject of the patent was a program which used equations to plot on a two-dimensional surface any desired view of a three-dimensional object.

The Court of Customs and Patent Appeals ruled that the program physically changed and improved the computer, reversing the Patent Office's refusal to grant the patent.

The two software cases are currently used by lawyers in assessing the software scene, although the course is fairly definite now.

Popper indicated that the Patent Office is no longer rejecting applications on the sole ground of the "mental step objection."

The office is also accepting technical language and diagrams, as long as they fit the long-standing requirement of being comprehensible to a person skilled in the art.

This last development occurred in the *Mahoney* case and removes one of the stumbling blocks to program patents.

No Prior Art

Sanborn pointed out that the Patent Office has "no particular backlog of program art to search" to determine whether or not a given program is new or old.

A project is currently under way to categorize software patents, and when complete will give the Patent Office a better indication of prior art. In the meantime, it remains, as Sanborn put it, "a joint technological problem."

Sanborn also pointed out that the courts have not ruled on whether an invention which involves both mental and nonmental implementation of a process can be patented.

The *Mahony* patent for a bit synchronization process is considered strictly a machine process, while the other inventions involve a process performed on a computer which can also be performed mentally.

The session was attended by nearly 250 persons, many of whom stayed to ask questions after the meeting moved to another room.

Michael I. Rackman, fourth member of the panel, replied to one question that it is difficult to estimate the cost of obtaining a patent. He compared it with asking how much does it cost to write a computer program?

Rackman said that, given good documentation and flow charts, the average patent attorney would charge $50 an hour to write the application and the claims of the invention.

Rackman also said that a program did not have to pass the test of being "unobvious" if the inventor only wished trade secret protection. He added that wide dissemination of the program would remove it from the category of items protected by trade secret legislation.

New British OEMs Penetrate Tight U.S. Peripherals Market

By Frank Piasta
CW Staff Writer

ATLANTIC CITY, N.J. – International Computers Limited (ICL), Europe's largest computer manufacturer, demonstrated four new products for the OEM market in its first venture as an exhibitor at a Joint Computer Conference.

Shown for the first time in the U.S. by the English firm were two document readers, a line printer, and a magnetic tape drive.

The 8962 document reader, available with either Micr or OCR and optical mark reader (OMR) reading systems, features a transport mechanism that uses compressed air to feed the documents through the reader.

This method enables the 8962 to run at a minimum speed of 600 document/min, on demand, and still safeguard the document by not allowing it to come into direct contact with the mechanism, ICL said.

The 8962 is available with ISO Class A or B fonts, size 1; with an optional optical mark reader available. E13B or CMC7 Micr readers are also available. A 16-character set is standard with a 48-character set available as an option. Computer-quality print can be read, according to the firm.

It will accept documents in the normal range of check sizes and allow a discrepancy of up to two inches in the lengths and one inch in height of the items being fed.

The other document reader comes in two models, the 8301 for OMR and the 8401 for OMR and OCR, both using the same transport mechanism.

Three controls allow the operator to set the machine for document length, width and thickness. Document sizes can range from 4-3/4 in. by 3 in. to 13 in. by 8-1/2 in. Paper weights can range from 16- to 24 lbs. The unit can read 150 document/min 8-1/2 in. long or more.

The design allows continuous loading and unloading. Either three or six output stackers can be provided. The mechanism recirculates documents for re-read, late read, or pocket address instruction, reducing the number of documents rejected, ICL said.

While the 8301 can only be equipped with an OMR reader, the 8401 can have both OCR and OMR readers. According to ICL, this allows the machine to be used for applications where a preprinted code line is supplemented by a marking field for exceptional data.

The mark reader features an insensitivity to folds and creases in the input documents, allows pencil, black ball point pen or computer printed marks to be read, and a flexible format controlled by plug board, clock track, program masking and context, according to ICL.

The character reader can read ISO Class A or B fonts, size 1, with a repertoire of 44 characters. It has a scanning beam three characters high allowing misregistered data to be processed. Up to four fields, each up to six inches in length, can be read at speeds up to 550 char/sec. The company said letterpress, litho, typewriter, or computer print can be processed.

Line Printer

A line printer using interchangeable drums and featuring a built-in forms stacker was also demonstrated. Called the 667 line printer, it is capable of printing up to 725 line/min, or 880 line/min if 50 sequential characters are used. Line lengths from 80 to 136 characters can be handled. Forms can vary from 4 in. to 15-5/16 in. wide and up to 18 in. long.

Six-part forms can be used. Horizontal spacing is fixed at 10 char/in. and either six- or eight line/inch vertical spacing can be selected by the operator. A loop of 8-track paper tape provides format control.

The printer is equipped with a print drum that weighs 10 lbs and can be easily changed by an operator if a different font is required. Normally, the unit is equipped with the ISO Class B size 1 font. ICL said that any font style and any selection of characters can be provided.

Tape Drive

A magnetic tape transport featuring automatic threading and 1,600 bit/in. capability was the fourth unit demonstrated. Using standard tape reels in wrap-around cassettes, the Model 8 can read tape at either 37.5 in./sec or 75 in./sec giving a transfer rate of 80K to 160K char/sec.

Compatible with Usasi standards, the drive has reverse reading facility, automatic parity check, and single bit error correction. Block lengths from a minimum 15 rows to a maximum 12,288 rows can be written, according to ICL.

The system may be specified to include two, three, or four drives. Each group of drives is associated with a control unit which is connected to the computer through a standard ICL 1900 interface.

ICL has offices at 839 Stewart Ave., Garden City, N.Y.

ICL Document Reader

Split-Screen Terminal Has Printer

ATLANTIC CITY, N.J. – A Teletypewriter-compatible CRT terminal that features a 1,998 character display and has provisions for the connection of a cassette recorder and a line printer was introduced during the SJCC.

The Hazeltine 2000 offers both split screen and editing capabilities. Cursor addressing can be directed by the program or operator to any character on the screen. The cursor, in addition to having horizontal and vertical movement, can be moved diagonally.

Selectable transmission rates as well as full- and half-duplex operation are said by the manufacturer to adapt the unit to the widest range of computer environments.

The ability to use commercial TV monitors as slave units and the modular construction of the device increase the versatility of the 2000, according to Hazeltine.

Editing capabilities include character insert and deletion, line insert and delete, data protection, tabulating, and variable roll-up.

The peripheral devices scheduled to be announced by Hazeltine include a dual-cassette reader/writer and an electrophotographic printer.

Price of the Hazeltine 2000 is $2,995, or $88/month on a rental basis. First deliveries are scheduled for July 1970.

Hazeltine Corp. is located in Little Neck, N.Y.

Potter's Present Peripherals Include Printer, Sorter, OEMs

ATLANTIC CITY, N.J. – Potter Instrument Co. demonstrated several products at the SJCC.

Announced was a line printer for the Potter keyed data recorder (KDR) that can be used as part of a remote data terminal when the unit is equipped with the communications option, and System/3 card-compatible OEM devices.

The addition of a line printer and communications option to the KDR results in what Potter describes as the lowest cost, high-speed communications terminal available.

The communications option is said to permit the transfer of data stored on magnetic tape at speeds up to 1,600 bit/sec over telephone lines to a similar terminal via the use of standard modems and transmission system.

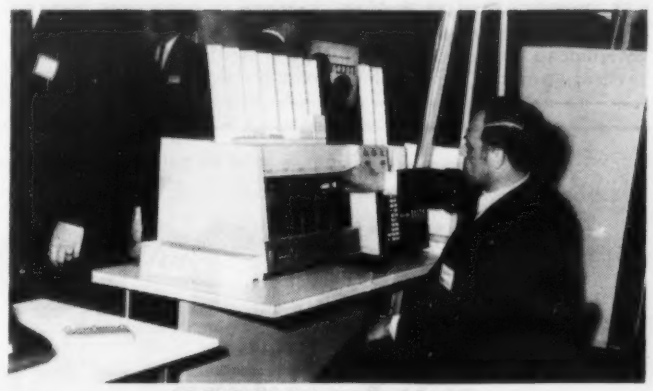
Bell 202 C, D, or equivalent modems may be used. The message format during transmission utilizes binary synchronous techniques, eliminating throughput-reducing start/stop bits, Potter said.

The LP 3000 line printer used with the KDR system operates at 135 line/min using 64 characters and 132 columns. Since it is an impact printer using a 5 by 7 dot matrix, it can produce up to three carbon copies. The LP 3000 operates on a new principle using a rotating scanner and 12 actuators, resulting in a design of extreme simplicity, according to Potter.

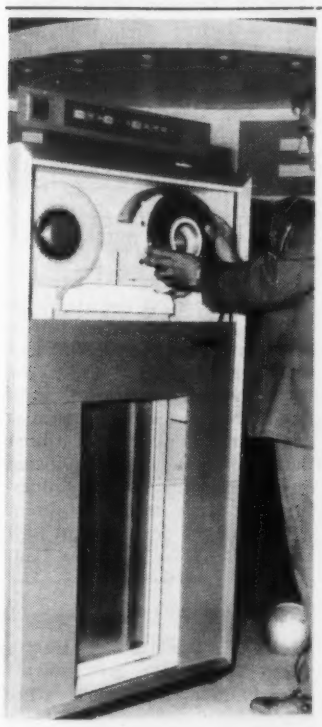
The price for the KDR with communications option and printer is $15,280 or $472/month. Maintenance costs are included in the rental charge.

System/3 card handling equipment has also been announced by Potter, but only on an OEM basis. The first two of what Potter describes as a complete line of peripheral equipment for processing the 96-column card are the CS 8000 card sorter and the CR 8000 card reader.

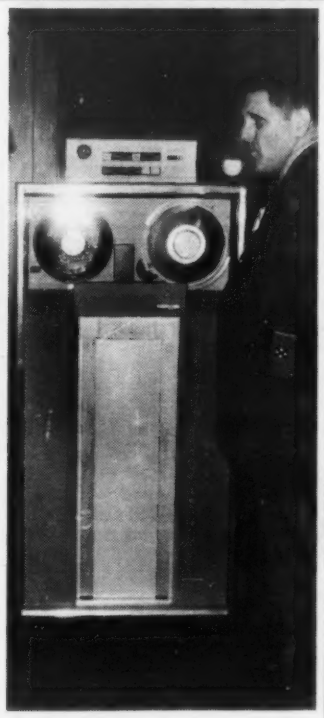
LP 3000 Line Printer



CS 8000 96-Column Card Sorter

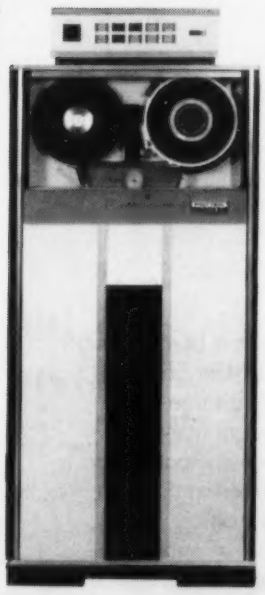


Telex



Bucode

Storage Technology



Potter

Compatible Units

Four of the magnetic tape drives by independent suppliers of peripherals demonstrated at the SJCC are compatible with the IBM 2420 Model 7. All feature self-loading tape and the ability to handle tapes at 1,600 bit/in. or cartridges at 200 in./sec. They are the DPF 2427 which is manufactured by Bucode and sold and maintained by DPF&G; the Potter AT 2427, the Telex 5420 Model 7, and the Storage Technology Corp. ST 2470.

These devices feature automatic tape threading without operator handling. Air currents guide tape to be loaded through precision air channels controlled by vacuum and air pressure ports. Elimination of operator tape threading reduces risk of tape damage, according to the manufacturers.

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State DP Needs Discussed

Communications Called Major Problem Area

ATLANTIC CITY, N.J. – Data transmission needs of state governments will quadruple in the next two years, according to a member of the National Association for State Information Systems (Nasis).

Larry H. Walker, Pennsylvania representative to the Association, told about 150 attendees of the SJCC session on Computing in State Government that communications would continue to be a major problem and area for improvement in the data processing industry.

The session addressed itself to several problems faced by state governments and also boasted of several positive applications which members of Nasas were utilizing.

Not Solutions

Unfortunately, most of the positive applications were not solutions to the problems such as, data communications, under-utilization, and poor planning.

Alvin Kaltman, session moderator and Massachusetts representative to Nasis, told of third generation system in his state which was being used solely in 1401 emulation.

"There is not a single productive program on that system," Kaltman said, charging that the computer was purchased before the state officials knew what they wanted it to do.

Kaltman also told of the head of a Massachusetts bureau who had an allocation of $600,000 for a computer, and who asked the data processing experts to "recommend something that costs that much."

Kaltman said the person did not know what applications would be involved, or space or other environmental restrictions.

The Computer Professionals for Peace (CPP) called on the panel members, all high state officials involved in the administration of data processing, to go to the American Civil Liberties Union for approval of data management systems since these systems would all use extensive data bases.

The CPP representatives compared the situation to going to the American Bar Association for legal questions or approval of federal judges.

CPP accused Nasis of being too narrow in its approach to problems. Involvement "as human beings, not just technical people," was called for by the four CPP attendees at the session.

The group also said it was concerned over the potential invasion of privacy in state data banks used for welfare, public health, police files, etc.

Daniel Magraw, Minnesota representative, replied that he was a member of his state's civil liberties board, and was "desperately concerned" with the privacy issue. This seemed to satisfy CPP members, who yielded to other questions from the floor.

Magraw continued to discuss the unauthorized divulging of information that is already present in society and government. "This is not necessarily a computer problem," Magraw said, "it's going on already."

Standards Stressed

Donald Croteau, New York representative, said that the states are all concerned with the development of standards, especially for certain software packages.

He singled out accounting procedures as a most likely candidate for state standardization so that individual states could take advantage of bulk purchasing of packages.

He also said that Nasis has a voting member on the American National Standards Institute's committee for Data Codes and Data Format, X3.8.

Additionally, Croteau indicated, Nasis sends representatives to meetings of the National Bureau of Standards' committee on Federal Information Processing Standards, and has a direct interest in the development of a Common Data Systems language.

Purchase Over Lease

John L. Gentile of Illinois noted that state governments were tending to purchase rather than lease computer systems. He also said that Nasis members were beginning to recruit from private industry in attempts to attract qualified professionals to state government.

Pennsylvania's Larry Walker noted that current federal funding restrictions had caused vendors to form "a regular parade down to the state governments."

He said that state professionals were becoming more sophisticated and that industry sales managers should send "the best man qualified."

He said that some companies considered state governments "as a new wilderness, and all they need to do is send down a couple of missionaries." Walker concluded that many states have highly qualified data processing personnel to deal with vendors.

Gentile echoed the thought that the creation of career paths and proper training was attracting more qualified personnel from private industry.

Software Association Plans Expansion

ATLANTIC CITY, N.J. – Determined to expand its role as the "voice" and "ears" of the proprietary software industry, the Association of Independent Software Companies (AISC) has launched a major membership drive.

At an open meeting held in conjunction with SJCC, association spokesmen outlined a record of accomplishments which they felt justified the decision to expand the group.

Before the open meeting, the members elected Herb Bright, of Computational Planning, president of AISC.

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Mentally Ill, Retarded Care Improves With 360/50

AUSTIN, Tex. – A computer is helping psychiatrists provide faster and better treatment for the mentally ill and retarded by providing rapid patient information that helps diagnose illnesses and prescribe and maintain programs of treatment.

Psychologists get far greater information than ever before about the number, types and needs of mental retardates in the state's far-flung network of special schools.

The system will soon follow each patient from admission until discharge, recording every step in his treatment program and through the recovery process.

"We are just beginning to understand and utilize the very significant potential of the computer in mental health," said Dr. John Kinross-Wright, commissioner of the department.

The Texas Department of Mental Health and Mental Retardation uses a 360/50. Terminals link the central computer with the department's nine mental hospitals, 10 schools for the retarded, and mental science research institute.

Special Schools

The agency has almost 12,000 retardates in its special schools and admits more than 17,000 mental patients to its state hospitals each year. It also supervises the programs at 27 locally operated community MH/MR centers throughout the state.

"We are developing standard patient data forms that will provide valid information about every patient within our system," Kinross-Wright explained.

"This means that any person charged with the treatment or care of a mental patient can quickly obtain an understandable record of the patient's case history. In the past, gathering such information might have taken weeks – if it was possible at all."

The computer system compiles and analyzes a central list of retardates on a growing waiting list for admission to state schools, allowing administrators to make placements according to greatest need. The computer's findings about the numbers of applicants from geographic areas are being used to help select the locations of special schools still to be built.

The computer also helps in such jobs as:

- Summarizing and analyzing all mental health facilities, manpower and services in the state for use in determining future state and community needs and planning to meet them.
- Providing lists of patients and students with specialized problems, such as visual impairment, to other state agencies that provide services to meet these needs.
- Offering automated accounting, payroll and fee collection systems that provide more accurate and efficient business office operations.
- Providing names and data on alcoholics admitted from each county to hospitals and other state agencies concerned.

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MAY 27th issue

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Issue date.....May 27 th

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See page 47 for sales office listings or call Advertising Department COMPUTERWORLD (617) 332-5606

Illinois Auto Unit Cuts Paperwork With 'Film Pages'

SPRINGFIELD, Ill. – The State of Illinois Motor Vehicle Division has gone a long way towards eliminating the paperwork explosion involved in processing more than five million automobile registration forms.

Like all states, Illinois compiles vehicle information for a variety of reasons – law enforcement being the primary one. Typical of the information collected and eventually distributed is the vehicle license number, manufacturer, model year, serial number, body style, and address of the principal owner. And this for each of the five million vehicles registered in Illinois.

Illinois Wheel Book

Once this data is processed and recorded, it is distributed to various state, county, and local law enforcement agencies. In Illinois, this means distribution to some 800 separate offices throughout the state. In carrying out this distribution the Illinois Motor Vehicle Division has traditionally prepared what is known as the Illinois Wheel Book.

In 1909, the first Wheel Book was issued. It was a 93-page booklet containing data from over 10,000 vehicle registrations for the years 1907 through 1909.

In 1967, the Wheel Book required a staggering 147 volumes to cover the five million vehicle registrations in the state.

It has been long recognized that the printed Wheel Book was unsatisfactory, but for many agencies it remained the only source of vehicle registration information outside of direct inquiry to the master file in Springfield. A volume, once published, was never corrected or updated and the first volume issues were obsolete before the final volumes were ready for printing.

The Illinois Motor Vehicle Division thus found itself in the strange position of being one of the largest book publishers in the state. All of which involved an annual cost to the state of $270,000, and even this represented a 36% reduction from the $420,000 which it cost to produce the Wheel Book in 1964, prior to the use of computers to prepare photoready copy for a printer.

Film, Not Paper

Today, the Illinois Wheel Book takes the form of film rather than paper, due to the new Stromberg Datagraphix computer output microfilm system that converts data from computer tapes to rolls of microfilm, and to the Kalvar dry-process that produces duplicates of the original microfilm.

An entire issue of the Wheel Book requires only 400 "film pages" and weighs only 48 ounces. In addition, the Wheel Book is now updated and issued eight times a year, as contrasted with the previous single edition.

What the 800 Illinois law enforcement offices receive each month is a packet of a varying number of 4 in. by 6 in. "film pages" known as microfiche. Each such microfiche contains 207 miniaturized microfilm images; with each image the equivalent of a full printed page of vehicle registration information.

Microfiche Use Simple

Using the microfiche is a simple matter of inserting it into a microfilm viewer that the Illinois Motor Vehicle Division has supplied to each of the 800 law enforcement locations. In a matter of seconds, the desired image can be easily retrieved and viewed – at 40 times its microfilmed size – on the magnified viewing screen.

Creation of the microfiche begins with the magnetic tape reels produced by the computer. The Stromberg Datagraphix computer output microfilm system converts the magnetic tape codings into readable characters which are then automatically photographed onto rolls of 4-in.-wide microfilm. A single roll of microfilm can condense up to 2,240 pages of print-out information – all in a matter of only 10 to 15 minutes.

After the original microfilm has been exposed and developed, duplicate copies are produced at speeds of up to 120 microfiche /min in the Kalvar Film Duplicator. Because the non-silver dry-process Kalvar film is exposed by ultraviolet light and devleoped by heat alone in normal room-light conditions, it eliminates the need for multistep chemical processing, vapor venting, or darkroom environments.

The duplicate rolls of Kalvar films are automatically sliced into 6-in. lengths by photoelectric cells from cut-mark on film, thus providing the individual sets of microfiche.

Only 400 of these microfiche "pages" are needed to provide all the vehicle registration data found in the 50,000 pages of the 147 printed volumes previously required for a single issue of the Illinois Wheel Book.

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And that reminds us too much of the competition.

For information, get in touch with our Marketing Manager: Data Systems Div., Sanders Associates, Inc., Daniel Webster Highway South, Nashua, N.H. 03060; Tel. (603) 885-4220.

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Computer 'Throws First Ball' in 'Dream' Tournament

By Edward J. Bride
CW Staff Writer

PRINCETON, N.J. – Two local Mills Brothers were singing "Take My Output to the Ball Game" recently, as their computerized baseball tournament got underway on NBC television.

The brothers are Dr. Harlan D. Mills, an IBM mathematics consultant, and Eldon G. Mills, a retired Air Force officer, described by an NBC official as "a baseball nut."

They have programmed a "dream tournament" similar to last winter's all-time boxing match between Cassius Clay and Rocky Marciano [CW, Jan. 28], which culminated a series of theoretical elimination bouts.

The brothers, partners in a firm called Computer Research in Sports, Inc., have collected about 8,000 variables in writing the baseball program.

They note that there are only about 20 "whats" that can occur in a baseball game: single, double, walk, hit by pitch, etc. There are over 8,000 "whens," they say, like third inning, one out, men on first and third bases, etc.

Consider the "Whens"

Current statistics, like batting average, or a pitcher's earned run average, do not consider the "whens." The brothers have recomputed such statistics to contain a "when factor," and they have utilized the 8,000 variables in doing this.

Then, they used a computer to "play" thousands of baseball games from the beginning; a random number generator started the games with the first variable.

The individual situations a player causes help to determine the affect he has on his team's chance of winning – his "player win average" (PWA).

The Mills brothers say their idea did not evolve from the boxing tournament, which was aired mostly on radio. Marciano and Clay actually got together last summer to stage the filmed final match, which was seen in over a thousand theaters.

In the baseball application, the game evolved from a book which the Mills' wrote, entitled *Player Win Averages.*

Two Basic Premises

The book is based on two premises. First, starting from scratch, any two teams will win 50% of their games but, as soon as a player reaches base or an out is made – in other words, as soon as there is a variable – then the chances of winning change.

The other theorem follows from the first, and states that each variable makes a measurable difference in a team's statistical chance of winning. It is each player's performance against that *measurable difference* that makes up his "player win average" which theoretically says whether he is an average, below-average, or above average player.

Actual film clips will also be used, although some tradeoffs in film quality will be made for the sake of authenticity. Obviously, the two teams playing each game will not be filmed in real action, as was the case in the boxing match, but each individual player whose name is used will be the player on film, performing according to the narration.

Except for the first game, fans around the country voted on the teams to play. The first game arbitrarily pitted last year's "miracle" New York Mets against the 1951 New York Giants.

Who Pays When DP Bill Comes?

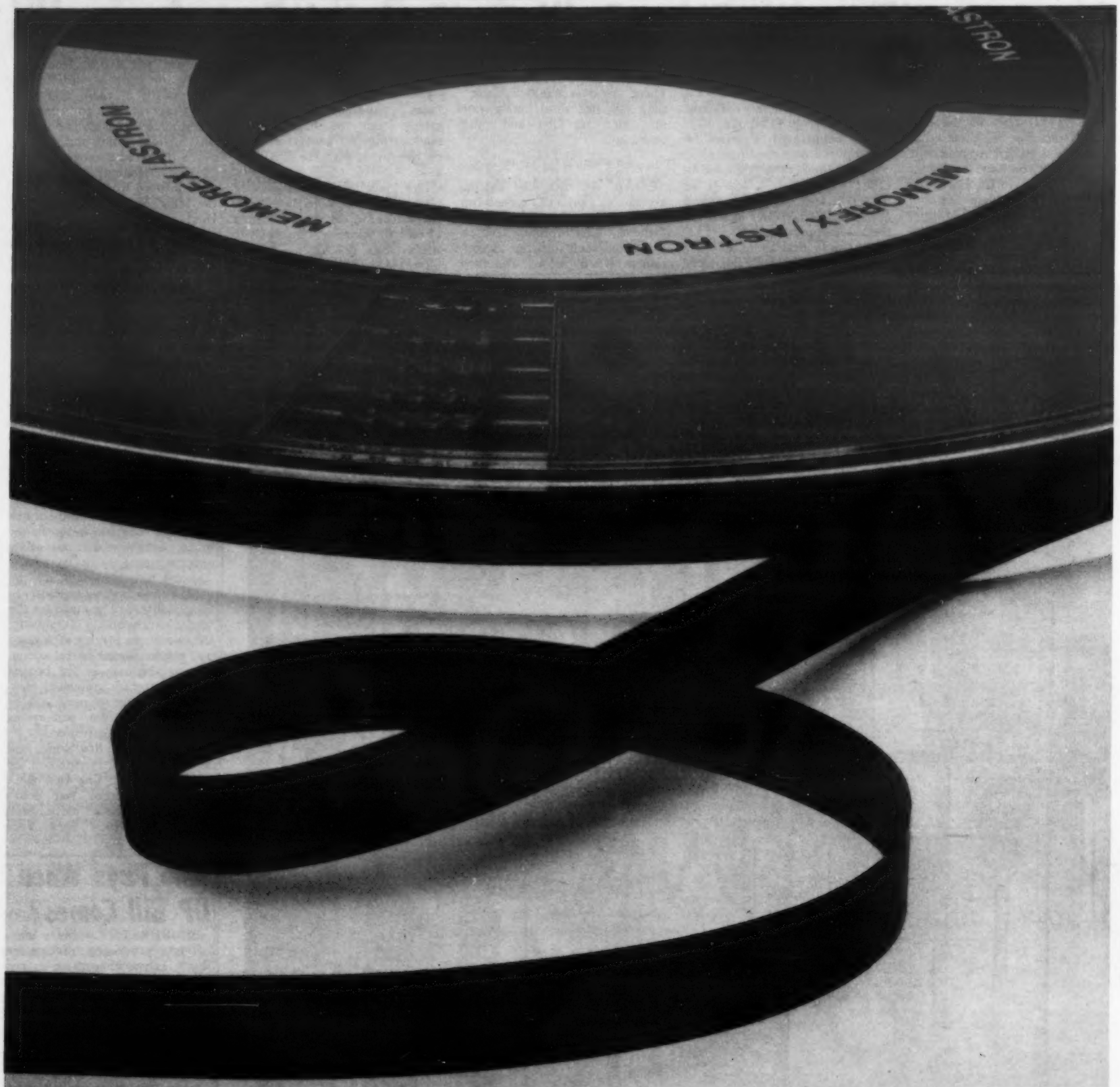
ELMHURST, Ill. – Many users of data processing information don't know what their queries are costing their departments.

That's the conclusion drawn from 43 replies to a survey of its clients conducted by Control-O-Gram, Inc., graphic analysts and communicators of financial and operations data for management.

Only 18% of firms with their own equipment or using service bureaus charged the costs to the using departments. Thirty-five of the companies charged data costs to financial or to general and administrative expense.

Thirty-four of the companies, with sales volume ranging from $4 million to $460 million, have their own equipment while nine with volume ranging from $2.5 million to $14 million rely on service bureaus. Only seven of the data equipment owners charged using departments and only one of the service bureau users.

Additional replies from six firms using office machines only report that all charge the cost to general and administrative. Of nine companies using mechanical tab equipment, two charge the using departments. Sales volume of the companies in the office machine category range from $1.3 million to $6 million and those in the mechanical tab group from $4 million to $75 million.



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MEMOREX

Amigos, Hyper-Faster Give Core Economy to OS/360s

By Don Leavitt
CW Staff Writer

ROCKVILLE, Md. – Significant core economies and throughput efficiences under OS/360 are possible with two software packages developed to replace IBM's Isam and to enhance Faster systems.

The Isam replacement is called Amigos. Developed by Data Art Corp., a Comress subsidiary, the access method is said to include all the same features and options as Isam. Comress said, however, that Amigos requires only one-third to one-half the core required by Isam. The company also said that timing tests show record retrievals by Amigos to by 50% to 300% faster than Isam.

Hyper-Faster

The second Comress program package is Hyper-Faster, designed to enhance the Type II IBM-supplied Faster. Utilizing Amigos for record access, Hyper-Faster is said to provide a "multi-thread" monitor for the basic Faster coding. This approach permits processing of ten transactions concurrently, according to Comress, compared to one-at-a-time processing under Faster.

To illustrate the core efficiency of Amigos over Isam, for random and index sequential processing, Isam requires 16K bytes of resident core while Amigos includes all accessing functions in one 9K byte control block.

Similarly, for random and index sequential retrievals each file under Isam requires appoximately 3,000 bytes of core. Since Amigos is a multipurpose routine, it is said to require only one set of channel programs and one set of control blocks. As a result, Comress said, only 600 bytes of core are required per file with Amigos.

The Amigos logic includes the blocking of overflow records whch, the company said, improves the utilization of disk space. With the elimination of the Isam chaining techniques associated with cylinder and independent overflow, Amigos is said to provide faster retrieval of records from overflow areas. Automatic reorganization of overflow records during normal operations is also a reported advantage of the Amigos access method.

The Hyper-Faster monitor is designed to direct the flow of processing to ensure the efficient use of systems resources; to initiate all I/O functions; and to manage and schedule activities with the system.

Comress said that the Hyper-Faster system dramatically improves the responsiveness of the user's system, especially during periods of high usage. With the implementation of multi-thread capabilities, the processing of multiple transactions concurrently allows for a larger number of transactions to be processed in a given time than is possible with Faster.

As an option for the Hyper-Faster user, Comress said that they will provide support for 2260 local terminals under OS/360. Since this capability is unavailable with Faster, many users will be able to remove remote control devices by using their 2260 terminals in local mode, Compress said.

Implementation of the Amigos/Hyper-Faster system is said to require no modifications to applications programs already using Faster language and logic to access records. The company said that the interfaces are supplied to make the modifications transparent to applications written in the Faster language.

File Conversion

Required file conversion consists of copying each Isam file to tape using an IBM-supplied utility program, and then writing each file from tape, and then back to disk, with a Comress-supplied load program. A maximum of thirty minutes per disk pack will be required for the entire conversion, according to Comress.

Comress said that the installation of Hyper-Faster will take about two days for each user, including file conversions and link-editing the system with Hyper-Faster.

Comress said that the Hyper-Faster system, including Amigos, is available under a license agreement for $38,000. The Amigos portion of the package, which can be utilized on a stand-alone basis, is priced at "about $15,000." Monthly payment plans might be available, but details have not yet been completed.

Comress is at 2 Research Court.

CL&S Says Evaluation Service Cuts CPU Operating Time on User's System by 10%

CHEVY CHASE, Md. – Computer Learning and Systems Corp. (CL&S) claims that users of the company's performance evaluation service can generally anticipate a cut of at least 10% in CPU operating time with their present systems.

CL&S said the service is aimed primarily at medium- to large-scale installations, including the 360/50 and up, Univac 1106 or 1108, GE 635 and larger, Honeywell and CDC systems. These users may need help, CL&S indicated, because they have not fully understood or utilized the capabilities built into their systems.

The performance evaulation begins with an on-site survey by CL&S. A follow-up report to the user's DP manager may recommend various CL&S efficiency-measuring tools to detect and eliminate bottlenecks. When implemented, the company said, the user should receive increased efficiency on his system.

The on-site survey of the user's installation by a team of two or more CL&S people usually lasts about a week, according to the company. The surveyors examine systems workloads, interview key personnel (both in and out of the user's EDP area), and note such basics as physical layout of the computer room, and relative position of tape/disk library to the CPU.

They also determine what accounting is kept of machine usage by job, department, or application. And they examine elements of data file organization that may be causing unnecessary loading/unloading of disk packs and/or tape drives.

The survey team's report to the DP manager may recommend the use of hardware monitors to determine the exact amount of CPU usage or utilization of a disk drive or communications channel during the running of a program. Software monitors are also available, and are geared to do some of the basic accounting, in terms of number of records processed, needed to isolate problem areas.

The Computer-Aided System Evaluation (Case) is a two-phase software package with which CL&S determines the running times and performance rates of all user programs operating independently and concurrently with other programs. The Independent Processor Analysis (IPA) phase operates in a manner similar to the systems and computers evaluation and review technique (Scert) program, according to CL&S, and is used essentially to provide basic input data for the second phase of the package, Concurrent Processor Analysis (CPA). In addition to the data from the IPA, the CPA considers schedule constraints and required sequences of programs.

The CPA phase includes a "step control language" through which the user can define these portions or segments of the processing he wishes to analyze. Essentially, the company said, the CPA phase provides the user with the capability of asking the "what if . . .' type of question.

CL&S said that, with the survey and the measurement tools, a wide range of problems, including personnel and performance bottlenecks, can be isolated. The company explained that "performance bugs" are those approaches to a problem within a program that often go undetected because they do not affect the total program logic. With their elimination, however, program efficiency often jumps sharply, the company stated.

Because of the nature of the service and even the extent of the survey desired, CL&S does not have a fixed price tag on the performance evaluation. A spokesman said that the survey would "probably" cost between $5,000 and $7,000.

The Case package is available independently of the service, on a lease basis. Written in Fortran, it can be run on a 360/40 and up with 256K storage, the CDC 6000, Univac 1106 and 1108, and GE 635. It costs $3,000/mo. on a month-to-month lease. On a 20-year lease, the cost is $30,000 plus $500/mo maintenance charge.

Computer Learning and Systems Corp. is at 5530 Wisconsin Ave.

'This Means War!'

Analysts Define Own Needs On General Ledger System

BURLINGTON, Mass. – A general ledger system that allows financial analysts to define their own needs has been developed by Manufacturing Management Sciences, Inc. (MMS).

Specialized reports, coded on simple forms, are stored in a report master file so that the information is provided automatically. This technique, MMS said, allows the system to satisfy the requirements of a large number of different users from a single data base.

The system also provides a series of management information and control reports on a regular basis which include balance sheet and profit/loss; comparison budget/actual; comparison salesman's sales vs. expenses; and, others such as cash flow.

MMS said that the regular reports reflect three levels of management concern. Reports broken down by department are generated weekly, while division reports are produced monthly and reports by company and/or subsidiary are scheduled annually.

With the MMS system, a user may have different account numbers for identical functions in different departments or divisions, as long as the relationship between the differing numbers is entered in the data base.

Pre-existing or specialized ledger number schemes can be used without change, MMS said, simplifying the original installation of the system, and the subsequent inclusion of new operations and/or acquisitions.

Although the package is a general ledger system, it utilizes a bill of materials processor type of organization to gain random access capabilities.

The system requires a 32K S/360 with at least two 2311 disk drives operating under DOS or OS.

Written in Cobol, the general ledger system sells for $17,500 which includes 15 days of installation assistance. MMS said that it will take "full responsibility" for installing the system and that the 15 days is normally adequate. The company will make a technical survey at no charge to establish the exact amount of assistance needed by a potential user.

Complete documentation is provided with the installation of the system, the company said.

Manufacturing Management Sciences, Inc. is at 279 Cambridge St.

Oscap Gives User Complete OS/360 Message Switching

NEW YORK – Designed to give the user a complete message switching capability in an OS/360 multiprogramming environment, the Operating System Communication Application Program (Oscap) has been developed by Complex Systems Inc. (CSI).

Similar in function to the IBM Communication Control Application Program (CCAP), Oscap is said to offer many improvements over CCAP system techniques. Chief among these, the developer said, is the fact that Oscap operates in a multiprogramming mode, whereas CCAP requires a dedicated system.

CSI said that Oscap provides all the classic message-switching functions, including: message retrieval; header analysis and formatting; and disk queuing and intercept. The header formatting includes time and data stamping, and sequence numbering, according to the developer.

CSI said that messages, which can be of any length, may be routed to multiple or alternate destinations. Oscap includes a unique "two-flag" method of monitoring the flow of messages, which makes restarts extremely easy. Each individual message is flagged when transmission starts, and again when transmission has been successfully completed. Other systems, CSI said, tend to flag whole blocks of messages, and then only when transmission starts.

Any user designated terminal can act as supervisor, according to the developer, transmitting messages and inquiring of the system. Oscap provides parameters which afford the user control of polling and delivery schedules, the company said.

Network statistics are accumulated for printed reports and off-line billing routines, according to CSI.

The system can be expanded or modified to suit any user's needs, sources at CSI said, and installation can be done in 60 days. Support exists for both switched and leased lines. CSI is presently integrating a data collection and dissemination system into the Oscap package.

Oscap operates under OS/360 MFT or MVT without any modifications, according to CSI. The system utilizes one pack of a direct access device, either a 2311 or 2314 disk unit. Core requirements are said to depend on network size, but typically a 20-line system containing 50 terminals would require a 40K bytes partition, the firm said.

Purchase price of Oscap is $40,000. CSI said that it can also be leased for $1500/mo.

Complex Systems Inc. is at 122 East 42nd Street.

CDC 3300/3500 Gets Automatic Report Generation, T/S Access

MINNEAPOLIS, Minn. – A generalized data management system featuring time-sharing accessibility and automatic report generation has been developed by CDC for its 3300/3500 CPUs.

CDC said that the Multiple Access Retrieval System (Mars-III) utilizes a single data base, from which users can extract information by simple English-like queries. Once phrased, the queries can be stored and later executed on call, a spokesman noted. He also said that the system includes protection against disclosure of information to unauthorized people.

Report generation under Mars-III is automatic, CDC said, in that, once defined in format, data fields and frequency of publication reports are produced on schedule, without operator intervention.

Featuring data base manager, inquiry, multi-access, and data extractor subsystems, Mars-III runs as a series of tasks under the Master operating system, and

Software/Services

utilizes the paged-memory capabilities of the 3300/3500 computer systems. This allows the concurrent, multi-programming features of Master to be utilized in addition to the Mars-III functions.

Hardware requirements for this 3000 series Mars-III package are a single 3304-2, a 3304-3, or a 3514-4 central processing unit, with minimum of four tape drives. A core of 98K is recommended on-line to permit both the Mars-III functions and batch processing. With 65K of core, any single Mars-III function can be performed with reduced multi-programming.

Price of the Mars-III package is $300 monthly royalty.

IBM 360 Package Aids Brokerage Houses' Paperwork Problems

WHITE PLAINS, N.Y. – A group of computer programs designed to help brokerage houses solve back-office paperwork problems is available from IBM.

The programs, called Brokerage Accounting System Elements (Base), enable an IBM System/360 to calculate the effect of security trading on most key areas of brokerage house activities.

According to IBM, Base will give brokerage houses improved financial and management control of their major back-office accounting functions.

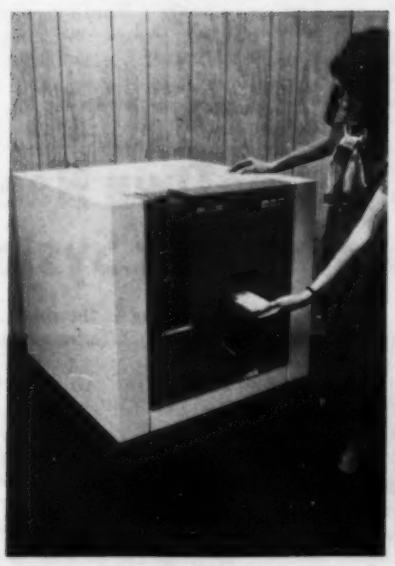
The programs can generate up to 75 timely reports that reflect the status of purchases, sales, stock records, dividends, transfers, customer statements, and "fails."

The Base system is triggered by trade execution data sent from the floor of a stock exchange to the brokerage firm, or by over-the-counter trades handled in the firm's order room.

The data – including security name, price, number of shares, and customer identification – is keyed into punched cards, which are fed into the computer on the day of the transaction.

The Base program can be used on 360/30 systems or larger having at least 64K bytes of core storage and operating under DOS. It is scheduled to be available under a license agreement in the second quarter of 1971 at a monthly charge of $800.

When it comes to credit cards, our eye is quicker than her hand.



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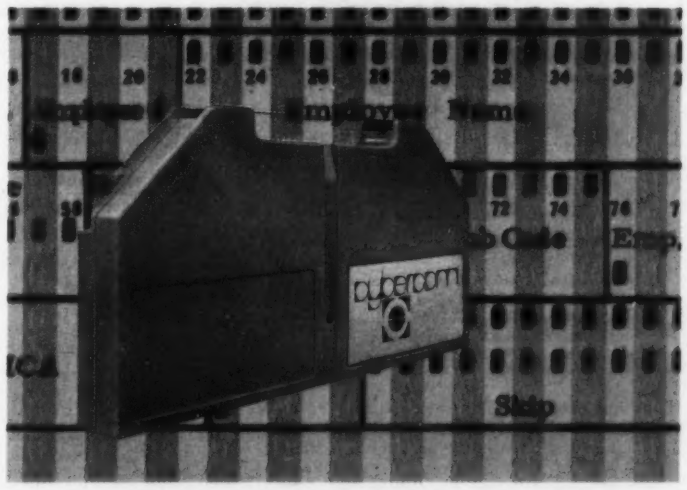

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Programmers Can Avoid Bias in Test Data Creation

BURLINGTON, Mass. – Programmers can avoid bias in test data creation by utilizing a "conditional field" generation feature that has been added to Synergetics Corp.'s Pro/Test, a test data generator.

Another feature added to Pro/Test allows the user to delete, modify, or use generated records prior to their being written on the output device. A company spokesman said that the user may also include his own coding in order to insert non-generated records.

Synergetics said that Pro/Test can produce files on magnetic tape, disk or data cell; on punched cards; or, on the printer. The user can define the files in terms of labels, record format, and blocking factor. Fields can be alphabetic, numeric, or binary. They can be generated randomly in ascending or descending sequence or in accordance with user-specified patterns.

Pro/Test has been implemented on the 360 under DOS or OS, utilizing 64K storage. A Honeywell version operates under the Basic, Mod 1 or OS200 operating systems, with 24K required. The developer said that an RCA Spectra version will be available this summer.

The Pro/Test package is available on a three-year lease basis for $4,900.

Synergetics Corp. is on Second Ave., in the Northwest Industrial Park.

Cyphernetics T/S Adds T4002 Software

ANN ARBOR, Mich. – Software support for the Tektronix Model T4002 graphic computer terminal is provided as a time-sharing service from Cyphernetics Corp.

The Tektronix terminal, a self-contained graphic display system is designed with a solid-state, data-entry keyboard. The terminal provides 96 upper and lower case characters, numbers and symbols, and 32 additional control characters for ease of operation, according to the company.

Other features of the terminal include an 84-character local memory and the capability of interfacing with a scan-converter for large screen viewing.

The user has the option of transmitting his graphics output either to a storage cathode ray tube on a terminal like the Tektronix 4002 for quick-look applications, or to a remote plotter for hard copy at his site, a company spokesman said.

For high precision drafting applications or high volume plotting, the user may make use of off-line graphics equipment at Cyphernetics' computer center, receiving the graphics output the next day.

The standard time-sharing charge is $10/hr for connect time and 2 cents per CPU unit.

The Cyphernetics Corp. is at 333 Maple Village Center.

Autocoder Translated to 360 ALP

LOS ANGELES – Convert/70, a system developed by Occidental, Computer Division of Executive Computer Systems, translates IBM 1400 Autocoder to 360 ALP.

The system is offered for sale as a package and is available as a conversion service.

The system utilizes a combination of programs and generative macros that will normally produce as high as 98% translation in tape system conversions.

Normal cost for the translation service would average $350 to $500 for the 12K, 1400 program. This would provide the user with complete translation and a "bug"-free 360 compilation.

The Convert/70 system will be sold for $4,800 for the basic system. This price includes on-site instrumentation and training. There is a 30-day delivery schedule.

The company is at 6430 Sunset Blvd.

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The powerful edit routines can verify your data as it is keyed into the system, thereby reducing the cost of duplicate keying for verification.

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Fewer operators. Less equipment. Improved accuracy. Greater flexibility and productivity all add up to significant savings.

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the first multi-keyboard data preparation system

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100 Cities to Get Subscriber Business-Data Network

By Ronald A. Frank
CW Technical News Editor

DALLAS – A communications service network that will handle data and provide other business services through franchised licensed offices expects to begin operations in 100 cities late this year.

To be known as the American Information Exchange (AIE), the network will business messages for subscribing data users.

The network will use private line facilities leased from Bell and independent carriers to link local offices operated as licensed franchises. According to the AIE plan, each licensee will arrange to acquire and maintain terminal equipment that is compatible with the data transmission methods used on the network.

An AIE spokesman told CW that initially the network will operate at 10 char/sec with teletypewriters. Later CRT displays with hard copy printout capabilities will be added, he said.

In a typical operation, a subscriber with a message to be transmitted would call

Communications

the local franchise office to dictate his message. The local AIE office would then transmit the message over the private line telephone facilities to the franchise office nearest to the point of destination. Some messages would be processed by the AIE central facility in Dallas where a store and forward capability would be available to schedule heavy-traffic lines.

Typical rates to subscribers to utilize the AIE message network would be about $2.50 to $3.00/1,000 characters transmitted, said Gene Smith, vice-president.

At present, 50 franchises have been licensed in 40 geographic areas. A license to operate a franchised office costs between $10,000 and $18,500 depending on geographic area, according to an AIE spokesman.

Although the network is scheduled to begin operations in October, a spokesman said that no private lines had yet been acquired from the telephone company. He added, however, that discussions with Bell representatives had indicated that the necessary facilities would be available.

Smith said that in addition to providing data services, the AIE franchised offices would provide stenographic, telephone-answering, and data processing services.

Smith said that the AIE would not be classified as a common carrier since the franchised offices would in many cases be processing data received from customers.

An AIE spokesman told CW: "We are not going to be constructing a communications network, that could be regulated. We are going to use the facilities of existing common carriers, namely the telephone company.

The American Information Exchange is a wholly owned subsidiary of Peripheral Technology, Inc.

MCI Affiliates File to Join Links

DALLAS – Three microwave communications companies which would interconnect links in Dallas as part of the national MCI microwave network have filed applications with the FCC for routes to Los Angeles, St. Louis, and New Orleans.

The affiliated companies are MCI Texas-Pacific, Inc.; MCI St. Louis-Texas, Inc.; and MCI Texas East Microwave, Inc.

The companies plan to lease a broad range of customized communications channels not now available to business, education, and government. They would provide services in competition with local telephone companies.

A precedent for this type of service was set last August, when the FCC approved a Chicago to St. Louis route for Microwave Communications, Inc.

MCI Texas would employ 64 microwave relay stations along its route from Dallas to Los Angeles through El Paso, Tucson, and Phoenix. Branches along the route will provide service to Albuquerque and Wichita Falls.

The MCI St. Louis-Texas service will have a system of 42 stations, including a branch linking Tulsa with Kansas City and Wichita.

Reaching south from Dallas, MCI Texas East Microwave plans a route through Houston to New Orleans, with a branch running from Waco to San Antonio.

The MCI carriers will offer 72 basic microwave channels, 20 of them specially designed for data transmission. Existing carriers now supply only three basic channels.

Twelve of the 16 carriers have now filed for FCC licenses. Each MCI carrier could become operational within nine months after receiving FCC approval, the companies said.

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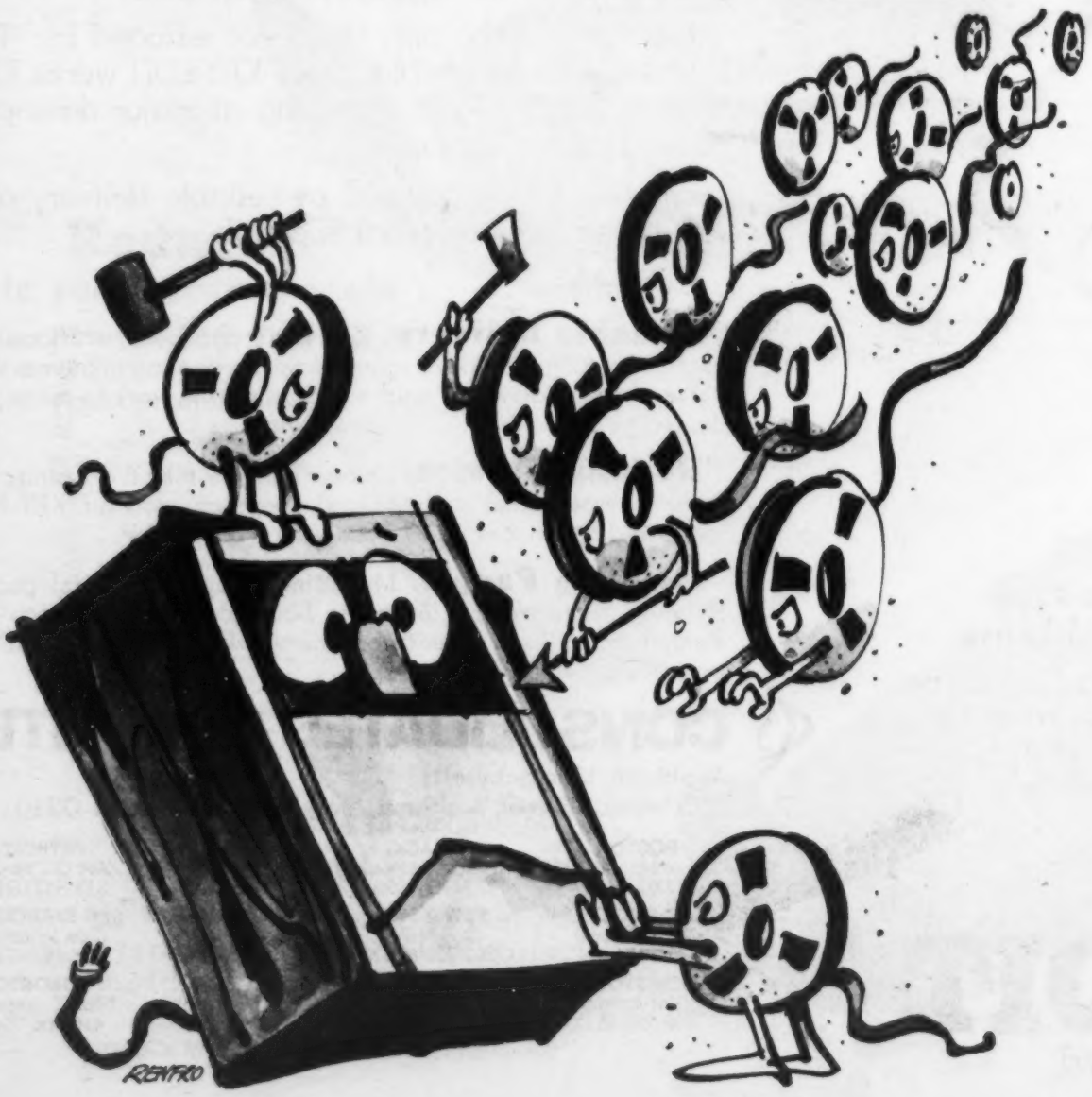

GE High-Speed Set Priced Under $1,000 For Short-Haul Usage

LYNCHBURG, Va. – A high-speed, short-haul data set in the GE DigiNet line allows printers, readers, plotters, and minicomputers to operate at their rated speed.

Priced "under $1,000," the TDM-330 data set provides transmission at 2,400, 4,800, or 9,600 bit/sec over physical, four-wire circuits up to three miles in length. Transmission is synchronous serial binary.

Transmission speed change is accomplished by means of an internal switch. The TDM-330 is equipped with a built-in test facility and an automatic line equalizer making installation and fault isolation possible without test equipment, GE stated. Interface to the data terminal or controller is an EIA RS 232 connector.

Full production of the TDM-330 will start in October, a company spokesman said.

The address of GE here is P.O. Box 4197.

Hong Kong Ranks Highest

HONG KONG – Hong Kong ranked highest in computer sales for IBM in all of Southeast Asia last year. Investment by Hong Kong firms in computers of different makes totals $10 million.

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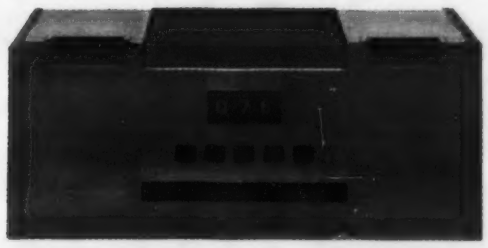

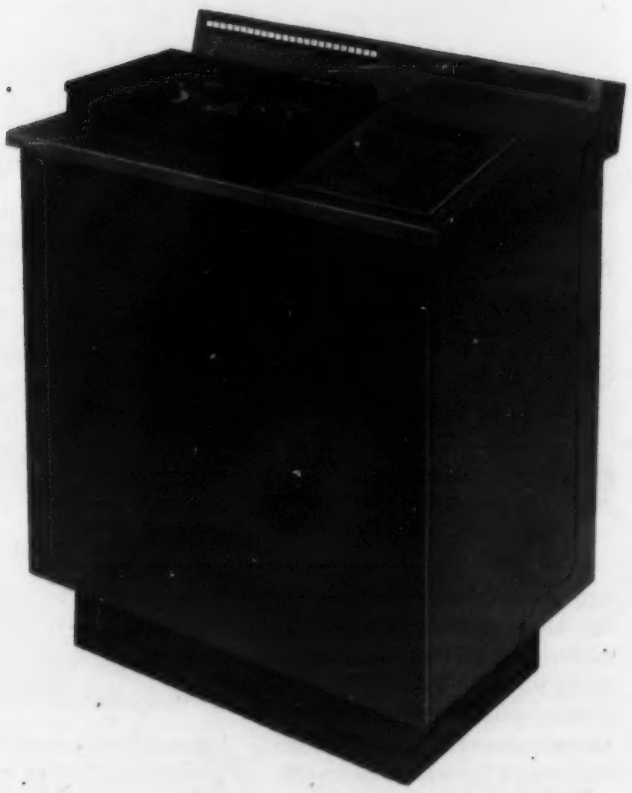

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New Literature

Beckman's type RM Dynograph, multichannel, direct-writing recorder is featured in a two-page bulletin. Number 665A describes the economical measurement system in which DC or AC signals from one microvolt to several hundred volts can be recorded directly. Physical variables via transducers are accommodated and recorded with a wide variety of available plug-in signal conditioners.

The literature also describes the convenient horizontal table write-out with z-fold charts and 16 chart speeds.

A booklet is now available describing improved and additional capabilities in the Score III Cobol program generator, reporting and file management system. Write: Mr. Robert P. Wolk, Atlantic Software Inc., 312 Layfayette Bldg., 5th. and Chestnut Streets, Philadelphia, Pa. 19106.

A four-page bulletin describing their real-time spectrum analyzer and digital integrator in one unit is available from Signal Analysis Industries Corp., Hauppauge, N.Y.

Information about a new series of low-cost, quality XY recorders, the Plotamatic 705 and 715, is available from Bolt Beranek and Newman, Inc., 1762 McGaw Ave., Santa Ana, Calif. 92705.

Manufacturing Data Systems, Inc., has available bulletin JH-470 on Compact II, the language/system for N/C machine tool control tape preparation.

For the brochure explaining all aspects of the Compact II, write: Manufacturing Data Systems, Inc., 2221 Packard Rd., P.O. Box 1045, Ann Arbor, Mich. 48106.

A free 28-page catalog of books on data processing-related subjects is now available from Brandon/Systems Press, Inc., 1101 State Rd., Princeton, N.J. The catalog includes books written for managers with limited experience of DP, as well as technical texts for specific applications of information science.

A technical bulletin by Dataram Corp., constructor of computer memory products, is ready for distribution. The bulletin, describing the model 201 automatic memory core tester, is available from Dataram Corp., Route 206, Princeton, N.J. 08540.

The range of software packages available for the Idiiom interactive graphics display system is described in an eight-page brochure. The booklet outlines the function and use of such packages as Fortran, MOS (master operating system), Idas and DAS programming systems, AID debugging package, TED (text editing subroutine), Trak light-pen tracking program, and a varity of graphics routines. Copies of the Idiiom Software Brochure are available from Information Displays, Inc., 333 North Bedford Rd., Mt. Kesco, New York 10549.

The Potter Instrument Co., Inc., has released a data sheet describing the company's new option for its key-to-tape data recorders (KDRs). For a copy of the data sheet, write: Potter Instrument Co., Inc., East Bethpage Rd., Plainview, New York.

A new Data Communications supplies catalog is available from Paper Manufacturers Co., 9800 Bustleton Ave., Phila., Pa. 19115. This catalog lists over 300 rolled and folded products for data communications, telecommunications and business machines. Also listed are the perfection tape handlers, a complete line of perforator tape handling equipment which represents the company's first non-paper product.

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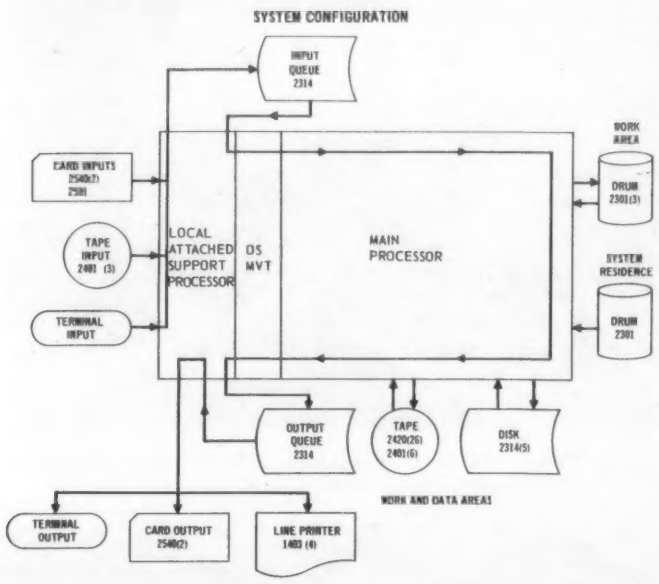


IBM 360/85 Processors Perform 2 Million Multiplication/Sec

Remote batch processing using IBM360/85 processors, capable of performing more than two million multiplication/sec is being offered by two companies, McDonnell Automation Co. and EDP Resources, Inc.

The McDonnell service, based in St. Louis, Mo., allows users to communicate with the system by voice-grade lines to one of the firm's regional offices. Direct communications links also can be established with the St. Louis center by users of IBM 1130s, 2780s, 1050s, and other System 360s.

Processing on the four-million byte 360/85 is "not costing users any more, than did the former system," said a McDonnell spokesman. "In some cases, it's less expensive than the 65/75," he continued.

A conversational time-sharing service using a GE 430 and an XDS Sigma 7 is tied into the McDonnell 360/85, the company said.

An estimated 1,000 jobs a day can be processed on the 360/85 and there is no limit to the number of users that can access the computer simultaneously, the McDonnell spokesman said, through the use of IBM OS/360 MVT.

Charges for McDonnell's 360/85 services depend on the amount of core used, I/) devices utilized, type of operation to be performed, and execution time. For example, a Fortran program that uses 220K of core memory (a 2301 drum and 2314 disk as I/O) and takes 5 minutes of CPU and channel time, would cost the user approximately $31, according to McDonnell.

The address of McDonnell Automation Co. is P.O. Box 516, St. Louis, Mo.

Users in the northeastern United States have access to a 360/85 located in Ottawa, Canada, through an agreement between Systems Dimensions Ltd., owner/operator of the system, and EDP Resources Inc., of White Plains, N.Y.

Remote batch processing is available through 2780 terminals and the 1130, 360, and Univac 9000 series systems. EDP Resources said that users with terminals already installed can have access to the 360/85 promptly. Otherwise, the company is installing terminals in White Plains to provide the 360/85 capabilities on a service bureau basis.

EDP Resources decided to use the Canadian-based 360/85 as an entry into teleprocessing and communications because it offered a capacity and price-performance never before available on a commercial basis. An 80-nsec CPU and more than 2,000K bytes of memory are balanced by an extensive array of channels and peripheral equipment, including 22 tape units and 32 disk drives.

Operating in an OS/MVT environment, the 360/85 can handle up to 15 jobs simultaneously, according to EDP Resources. In addition to the OS/360, the software library available through the 360/85 includes Cobol, Fortran, Assembler, PL/1, Algol and RPG compilers, and a broad range of application programs. A Systems Dimensions Ltd. spokesman noted that the 360/85 typically can process a mix of about 1,000 jobs a day.

Charges for use of the 360/85 are calculated by the machine itself, utilizing an accounting scheme called Accountpak. This package is said to measure and record system activity, system occupancy, I/O, operator activity, and supplies. In this way, the customer is charged only the cost of the actual facilities used.

Deliberately unwilling to cite any sort of "average job" cost, the spokesman for the Canadian firm noted, however, that users under the EDP Resources would have to sign agreements calling for minimum annual costs of $720.

EDP Resources Inc. is at One North Broadway, White Plains, N.Y.

Communications Controller Provides 1130 User High Throughput Rates at Low Cost

By Frank Piasta
CW Staff Writer

SAN PEDRO, Calif. – A communications controller produced by Logicon Corp. offers the 1130 user high throughput rates at low cost.

The Logicon Input/Output Network Multi-line Communications Controller (Li/On MCC) series of devices are connectable directly to the IBM 1130's Storage Access Channel (SAC), eliminating any need for the multiplexer necessary with the recently-announced IBM MTCA [CW, April 22].

The models of the Li/On device are available: the MCC1 that can accommodate up to 16 lines with a maximum total throughput of 21,500 bit/sec; and the MCC2 that can handle a throughput of 43,000 bits and 32 lines. Models with 48 and 64 lines are available on special order, the company said.

Logicon said that its system, because it uses cycle stealing techniques, causes less interrupt time in the computer program being run than does the IBM system of direct program control. Under the Logicon system, a character requires 20 μsec to cross the interface between the controller and computer, whereas the IBM system, according to Logicon, would require 500 μsec.

The computer program under the Logicon system is not interrupted for receiving data until the line buffer in memory is full or an end of message or some other interrupt is detected. On transmission, the computer program is not interrupted once the line buffer in memory has been filled.

Core Requirements

Minimum computer configuration for the Li/On MCC units calls for an 1130 with 4K words and either a SAC1 or SAC2 channel. Core requirements for various applications vary. For example, an installation using teletypewriters would have to allocate 900 words of memory for the software required and an additional 64-word buffer for each line.

Logicon supplies the software, consisting of an Interrupt Servicing Subroutine (ISS) which is callable by Fortran and Assembly Language programs. The ISS requires no changes in the standard IBM 1130 disk monitor program and so enables the user to take advantage of IBM's maintenance of the monitor. The ISS is warranted by Logicon for a period of one year.

In addition to being compatible with all Teletype and Teletype-compatible terminals, Logicon said the devices can be used with the IBM 2740 and 2741, the Viatron System 21, Sanders, and Courier terminals.

The Li/On MCC1 is priced at $7,400. The MCC2 costs $8,600. The 48- and 64-line models would cost approximately $9,800 and $11,000, respectively. An additional cost of $830/line must be added to each model.

A typical configuration, consisting of the Li/On MCC1 controller and six line adapters would cost $13,470. This price includes the purchase price of the required IBM SAC channel. The Li/On controllers are available on a 30-day delivery schedule.

Logicon Corp. is at 255 W. 5th St.

80-Column C600 Reads Crinkled and Bent Cards

NORRISTOWN, Pa. – An 80-column card reader for minicomputers features simplicity of construction and ease of maintenance at a low cost.

The PDI C600 Series of readers by Peripheral Dynamics, Inc. is a 600 card/min reader which reads cards that are crinkled, bent, and otherwise mutilated. The photoelectric reading mechanism allows the processing of cards with misregistered punches, the company said.

According to PDI, most users of its prior card readers have supplied their own computer interfaces. With the C600 Series, the company will supply interfaces if the customer desires them. The details on which minis will be accommodated have not been released, but the company said that interfaces for the most popular processors will be provided.

The 600 Series includes the C601, a table model, and a rack-mounted model, the C602. They are both, according to PDI, designed for use in either office environments or industrial data processing systems.

The C600 Series reader has several features designed to prevent damage to its mechanism: feed stop and operator attention lights for output hopper full/empty, and "three successive pick failures"; a motor shut down in event of a card jam; and a front cover interlock switch.

The input hopper capacity is 900 cards and the output hopper can hold 1,000 cards. Unloading "on-the-fly" is always permissible and loading "on-the-fly" is possible as long as 200 or more cards remain in the input hopper, the firm said.

The C600 units are loaded and unloaded from the front and accept cards punched in any format, reading the data column by column. Sufficient control lines are provided so that readers can be adapted to operate with either general purpose computers or with remote terminals, PDI said.

The price of the C601 tabletop unit is approximately $2,700.

Production of both models is scheduled to begin in October. The unit will be available on a 30-day delivery schedule.

Peripheral Dynamics is at 1030 West Germantown Pike.

Microprogrammed Mini Contains 220-nsec Microinstruction Time

CINCINNATI, Ohio – A general-purpose minicomputer which has a magnetic core memory that can be programmed by software is being offered by The Cincinnati Milling Machine Co.

Designated the CIP/2100, its features include 15 general purpose, 8-bit file registers; seven dedicated working registers; microprogram control; 16 microinstructions (including logical, arithmetic, control, and literal data); 220-nsec microinstruction execution time; and read-only memory space up to 1,024 instructions.

The programs are sorted in core memory, and instructions are interpreted by microprogram sub-routines in the read-only memory.

Other standard features include six operational registers; instruction set with 89 instructions; eight operand addressing modes; multiprecision 1-, 2-, 3-, or 4-byte load, store and arithmetic operations; concurrent I/O; and a built-in bootstrap loader.

Typical ADD execution time is 5.06 μsec; MULTIPLY is 63.36 μsec; and DIVIDE is 83.6 μsec.

Support software for the CIP/2100 consists of a Cross Assembler written in Fortran IV; a two-pass assembler that assembles programs from tape or cards on the 2100; a tape editor used to make program revisions on teletypewriters; and a tape operating system that controls the processor for program loading, execution and debugging.

Optional features available include memory parity generate and detect, memory page protect, power-fail, safe/automatic restart, range of I/O devices, direct memory access, expandable priority interrupt system, and up to 32,786-byte memory (4K increments).

The CIP/2100 is available for immediate delivery. The minimum configuration with 4K memory is priced at $6,162.

The Cincinnati Milling Machine Co. is at 4701 Marburg Ave.

Microfiche Master System Has Precise Micro-Image Alignment

SPRING VALLEY, N.Y. – A system for making precise-register microfiche masters for use with devices such as automatic retrieval readers is available from Atlantic Microfilm Corp.

Called the micro-pin microfiche master system, it consists of three units – the micro-pin programmer, master formulator, and film trimmer. The main feature of the system is said to be precise alignment of micro-images.

Other features include pre-cut tape and title-filler strips, packaged for the appropriate format size. The system works normally with 16mm film from microfilm cameras or COM units.

These holes act as the registration guides on the master formulator. The punched roll of film is then precision cut, if required, to proper mounting width on the film trimmer, and the fiche master is prepared on the micro-pin formulator.

The master formulator consists of a film loading station, cutting station, and mounting section. The punched and trimmed microfiche is cut, and the individual strips are mounted using the registration holes and pins. When the appropriate number of filmstrips are mounted, pre-cut tape strips are used to hold the strips together as a master. This master can then be used to make duplicate fiche on equipment such as a printer/developer system.

Delivery is about 10 days. The total system costs $2,295.

Atlantic Microfilm Corp. is at 700 S. Main St.

Micro-Pin Microfiche Master System – Three Units (left to right): Micro-Pin Programmer, Master Formulator, and Film Trimmer.

dp accessories

Designed to meet NMA (National Microfilm Association), Cosati (Committee on Scientific and Technical Information), and government standards, the micro-pin system can create 3 by 5, 4 by 6, or tab-card-sized microfiche, high-reduction and superfiche.

The units may be purchased separately, allowing a user to add additional programmers if production increases, a company spokesman said.

A cross-hair optical sighting/target system in the programmer is used to precisely align the filmstrip before punching. By pressing a button, the operator activates the motorized, slant-pin, line-up punches which form registration pin-holes.

Interface Test Set Allows User to Isolate Failures

BAILEYS CROSSROADS, Va. – A test instrument available from Pulse Communications, Inc. allows data terminal users of limited technical skill to isolate failures at interface connectors between data terminals and data modems.

Called the Model 505 Data Interface Test Set, the device lets the user locate the source of the system failure so that he can contact the correct maintenance organization – either the data set or the terminal manufacturer, the company stated.

The test set provides access and control for RS-232 interface. With the interface, any connector lead can be opened or closed, and any control signal such as carrier on, data set ready or request-to-send can be simulated, the company stated. Indicator lamps on the test set provide signal station information.

Skilled maintenance personnel may also find the device useful as it provides access to both sides of the interface for the insertion of oscilloscopes, error rate analyzers, and related equipment, the company said.

The test set can also simplify the simulation and testing of the various control functions, according to the company.

The Model 505 Data Interface Test Set is available for immediate delivery and sells for under $400.

Pulse Communications, Inc. is at 5714 Columbia Pike.

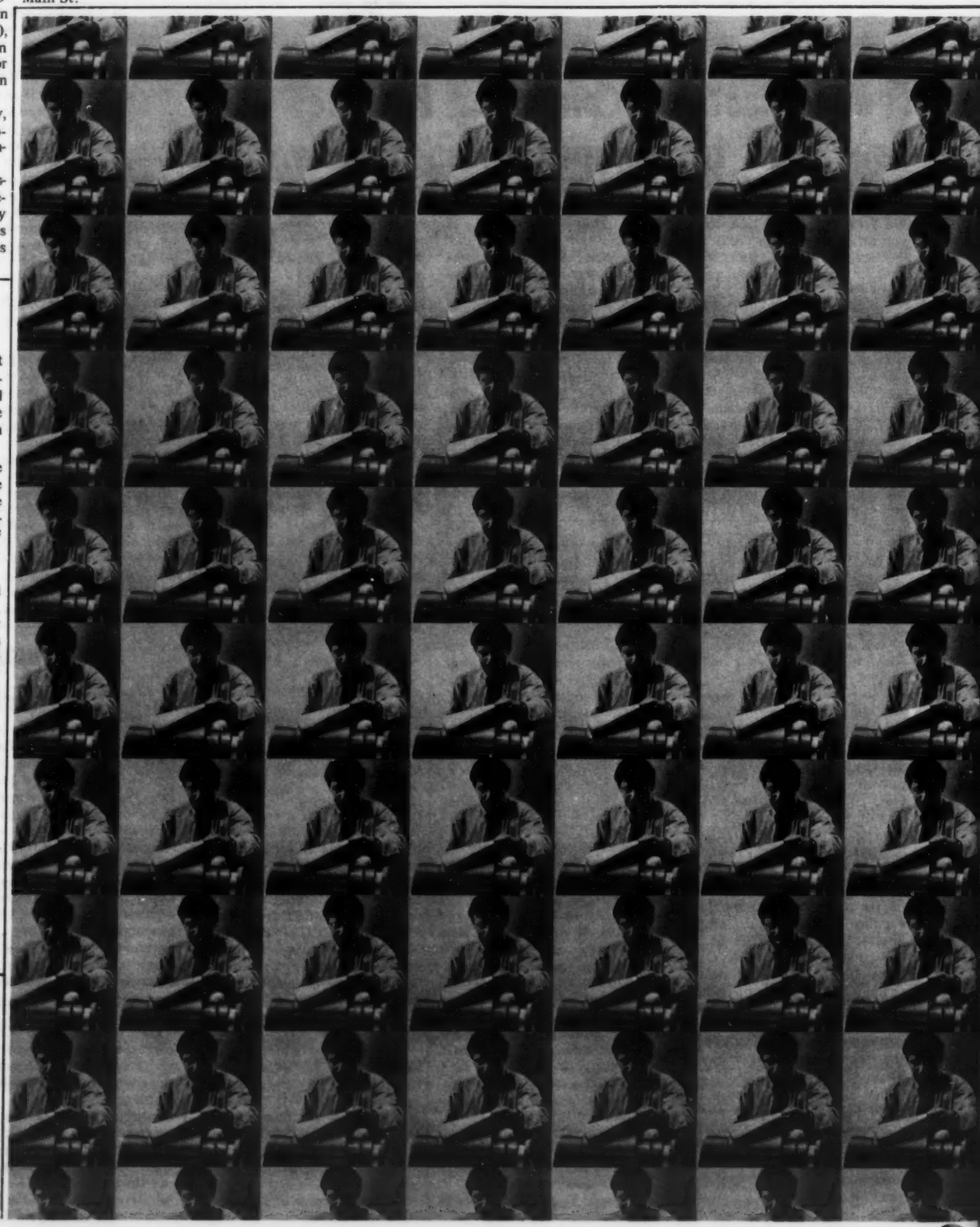
Shelf for Telephone and Coupler

SAN DIEGO, Calif. – Typagraph Corp. has available a shelf designed to accommodate a telephone and acoustic coupler or a data phone for use with its line of terminals.

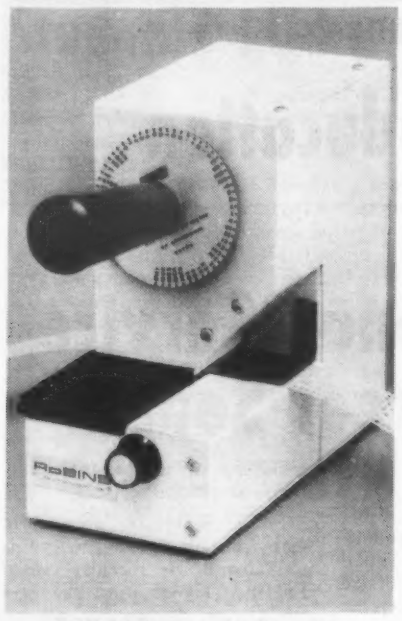
The shelf installs in seconds on the right-hand side of the terminal case. Weighing five pounds, the shelf does not interfere with access to the inside of the terminal, the company said.

The shelf costs $25.

Typagraph Corp. is at 7525 Convoy Ct.



Mechanical Hand Encoder Perforates Tape, Cards



DCN-64 Commander Encoder

COLLEGE POINT, N.Y. – For computers and tab equipment that accept instruction from perforated tape or edge-punch cards, a mechanical hand encoder is offered by Robins Data Devices, Inc.

The Model DCN-64 Commander encoder uses what is called "an easily programmed revolving drum." It can be programmed with up to 64 individual codes in eight channels, plus feed holes, providing capability for a variety of hole-punch systems, the firm said. Special versions for mylar tape and edge-punch cards are available.

No Electricity

The DCN-64 desk-top unit requires no electricity or batteries, the company said. The encoder is operated by selecting the desired code on a dial and pressing a lever. The tape or card automatically advances as each code or space is punched.

Hole spacing is .10 by .10 inch, or advanced feed.

Robins recommeded its Commander where programming volume does not warrant extra electronic gear; for back-up, corrections, or supplemental use in emergency situations; and in teaching and sales demonstrations of major equipment.

Delivery is four to six weeks for the Model DCN-64 Commander which costs under $100, with orders of around 25 units and up.

Robins Data Devices, Inc. is at 15-58 127th St.

'Power Guard' Watches Voltage

FT. LAUDERDALE, Fla. – A device called PowerGuard ends voltage fluctuations in powerlines by providing a long-term, permanent record of the amplitude, duration, and time of occurrence of power line fluctuation, according to its developer, Western Union Computer Utilities Inc.

A PowerGuard recording device connects directly to input power lines for monitoring and recording high-speed transients. The continuous monitoring system sounds an alarm when transients occur and permanently records the amplitude, duration, and time of occurrence.

The transient detection PowerGuard device includes strip chart recorder, transient detection electronics, automatic reset, continuous panel display, and an internal digital clock to record the precise moment of power fluctuation, according to the developer.

dp accessories

PowerGuard is available for 115-, 208-, and 230-volt installations. Transient durations detected are 0.1, 1, and eight msec; voltage transients are detected and recorded at levels of ± 10% and ± 20% of the nominal voltage.

PowerGuard sells for $1,175 and can be leased for $36.50/mo.

Western Union Computer Utilities Inc. is located at 2455 E. Sunrise Blvd.

UTS holds 128 conversations while it does its batch and real-time chores.

But it isn't the ultimate.

Some of our salesmen say UTS stands for the Ultimate Time-sharing System. Don't you believe it.

They cite as evidence the fact that UTS is the only system designed to handle time-sharing, batch and real-time on a Sigma-size computer.

And the fact that 128 on-line users can converse with the system simultaneously. That UTS handles both local and remote batch. And that all on-line processors are re-entrant and are shared by on-line and batch programs.

They'll tell you that UTS keeps track of what it's doing every moment, and will report to you on request. What's more it allows you to change the operating parameters to suit your conditions at any given time. For example, you can set limits on time-slices, or on the amount of core each user is allowed, or dictate the minimum batch thruput, right at the console while the system is running.

XDS
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El Segundo, California

The facts are right. But our salesmen are wrong about the name. UTS stands for Universal Time-sharing System. The ultimate system it isn't.

It's only the ultimate system available this year.

Cartridge Carrousel Stores 40 Tapes, Standard Cassettes

REDONDO BEACH, Calif. – A storage and retrieval unit for 16mm microfilm cartridges, IBM MT/ST tapes, and standard cassettes is being offered by Rose-Wood of California, Inc.

Called the Cartridge Carrousel, the device comes in two models – the 24-capacity Model 850 and the 40-capacity Model 950. The 9-inch-round carrousels revolve easily and quietly, the company said.

Model 950 Carrousel

The unit has a carrying ring.

The Model 850 Cartridge Carrousel costs $11.95, and the Model 950 costs $16.95. Delivery is 10 days.

The address of Rose-Wood of California, Inc. is P.O. Box 347.

Audev 6400 Tape Has 6,400 Flux Change/In.

GLENBROOK, Conn. – A computer tape capable of recording at densities up to 6,400 flux change/in. is available from Audio Devices, Inc.

The Audev 6400 tape is compatible with current computer systems and adaptable to future computer equipment, the company said.

A coating formulation with a high efficiency binder-oxide system increases wear resistance, the company stated.

Audev 6400 tape costs $17.50 per reel, for 1 to 99, 2,400-ft reels. The reels are offered in other lengths. Delivery is immediate.

Audio Devices, Inc. is at 100 Research Drive.

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COMPUTERWORLD

education

'Pathfinders'

Educational Service Aids Career Search

By Harvey Elman
CW Staff Writer

BUFFALO, N.Y. – "A marriage between data and people" is the by-product of an experiement in educational services that has evolved into an international organization in educational and vocational counseling.

Thomas N. Schwob and Mrs. Kurt Klein, co-founders of Pathfinders Educare Inc., cited the existing need for one agency which could serve young people and their parents in picking potentially successful careers and the right college, and, in some cases, to provide tutoring services to achieve desired goals.

Pathfinders Educare Inc. is designed to meet all those needs and to work as a "problem solver" for anyone faced with career and educational dilemmas.

A direct wire connects with the computer center of Interactive Learning Systems in Boston, which employs a Burroughs B3500. Via a KSR 33 phone-line printer, Educare counselors can retrieve data on some 3,000 colleges from the memory bank.

As the requirements and desires of an individual student are fed to the B3500, an instant reply reveals which colleges can fill the need.

'Unrealistic Choices'

But the biggest part of counseling still is vital. One of the biggest services which Schwob feels Educare can provide is to avert what he calls "unrealistic choices" by young people and their parents.

Often, he noted, parents think of their own colleges as being what they were a quarter-century ago, not what they are today. And, he added, the young people are not the same as their parents were at college-entrance age.

Schwob has concentrated on assembling qualified groups of counselors and tutors. "Our trained professionals interpret the data for each student," he said. A major program now is tutoring in reading.

No age limit has been set on the clientele which the firm serves. Schwob currently is evaluating a letter he received from a prison inmate who wants to know what he can do with his life when he leaves prison.

The co-founders are also deeply interested in what they refer to as "retrieval" or "second chance" cases. These involve those who have found college such a demanding or unsatisfactory experience that they have quit. A solution must be found to enroll such dropouts into a satisfying and successful educational program, they said.

College is not the answer for many young people, according to Schwob. He recently visited England, investigating the possibility of setting up an apprenticeship program for auto mechanics.

Under it, interested young men could go to England to work as mechanic apprentices and then return to the U.S. as mechanics qualified in servicing foreign cars – a field now suffering from a shortage of trained persons.

Counseling Services

Another problem he checked out in England was the need for counseling services for the children of 60,000 American servicemen in Europe, as well as the dependents of Americans working abroad in the diplomatic services and in business branch offices.

By June, he hopes to have an Educare satellite office in London and plans to establish similar offices in other major foreign cities. U.S.-based branches are planned for Boston, Garden City, N.Y., Miami, Washington, D.C., Philadelphia, Atlanta, Louisville, Dallas, and Los Angeles.

The organization, stressed Schwob, is not set up to take over the roles of the parents or the school guidance counselors. Rather, it is being designed to serve as an aid to them. And, he hastened to add, "We don't play God."

Schwob visits as many colleges as possible to personally check on all the facilities, even to the point of eating in the dining halls.

Government Grants

One decision that had to be made early was whether Pathfinders Educare would operate with government grants. It was decided to set it up as a private business.

As the business grows, stock may be offered for public sale. Educare now pays nearby Rosary Hill College for the use of its facilities. Eventually, the college will become a stockholder.

Schwob and Mrs. Klein envision future work among youth who are burdened with physical and mental handicaps. The firm now runs a testing program which includes I.Q., diagnostic achievement, aptitude, interest inventories, personality, and aptitude.

The far-sighted foreign program could become a two-way street, they agreed, with the firm assisting foreign youths who wish to train in the U.S.

Students Make IBM Computer 'Stay After School'

BALTIMORE, Md. – A computer is keeping pupils after school at Baltimore Polytechnic Institute, and the students think it's great.

Since an IBM 1130 was installed a few months ago, it has been nearly impossible to get the high school students out of the computer room.

"They get so involved in their work that we almost have to chase them out at 5 p.m.," said William Stonesifer, head of the mathematics department.

The 1130 is used as a tool to help students in classroom assignments as well as to teach programming. The school is one of a small number of high schools in the nation that have a system dedicated entirely to student use.

"We brought the computer into the school for the same reason we have a full-size diesel engine, welding units and vacuum chambers – to help our students learn by having the best equipment available," said principal William Gerardi.

Head Start

We believe the computer will give our students a head start in pursuing whatever career they choose," he said.

Baltimore Polytechnic, founded in 1888, was the first public school in the country to offer manual training. Most students now pursue a college preparatory course which includes such subjects as calculus, surveying, analytical chemistry, electricity, and mechanics.

Many students have already learned how to program. Several taught themselves using IBM manuals.

Use of the computer ranges from solving college-level math and engineering analysis problems to complicated games conceived by students. Typical examples include:

- Find the specific temperature of a heated metal sample.
- Interpolating the "water" content of moon dust by comparing characteristics of dry earth samples in a lunar-like vacuum.
- Studying how temperature affects the speed of sound.
- Playing three dimensional tic-tac-toe.
- Determining how long a cup of coffee will stay warm.

Teachers are now attending a special class to learn how to program so they can provide pertinent instruction for students. IBM system engineers, under contract to the school, teach the class two afternoons each week.

Of the 2,800 all-male student population, more than 200 can use the 1130. Some ninth graders are learning Fortran.

Next year all students will learn how to program and use the computer.

David Buchoff, a mathematics teacher at Baltimore Polytechnic Institute, discusses a printout with a student using the 1130. The high school is among a few in the nation with a computer dedicated entirely to student use.

William Stonesifer, head of the school's math department, discusses a project with a student. At the blackboard, another student works out a program.

...As the Homework Gets More Difficult

ARLINGTON, Texas – Exceptional students may be provided computers by school districts for use at home within two years, said R.H. McKay, president of the Texas Congress of Parents and Teachers at a conference here.

"This is the computer age," he said, "and it is necessary for lay people, particularly mothers and fathers, to know what the age will present from a sociological standpoint as well as an economical standpoint."

McKay said it is clear that such a program will be costly, but, "through necessity, we must have it."

During the first 300 years of public education courses in America, he continued, students have been taught reading, writing, and a numbering system. "We still need these, but the computer presents something entirely new for this century," he said.

Urging that parents be alerted to the capabilities of the computer, McKay said: "They (computers) not only will change school life, but home living will be affected by them."

Calendar

May 13-15, Miami – 8th Annual AEDS Convention with the theme "Education through Technology." Contact: Association for Educational Data Systems, 1201 Sixteenth St., N.W., Washington, D.C. 20036.

May 14-16, St. Petersburg – Ninth Annual Southeastern Regional ACM Conference. Contact: Mr. Dale Brandt, IMC Corp., P.O. Box 867, Bartow, Fla.

May 19-21, Phoenix, Ariz. – GE 400 Computer Users Association Annual Conference. Contact: Bruce H. Reinhold, Pittsburgh National Bank, 10th St. and Fort Duquesne Blvd., Pittsburgh, Pa. 15222.

May 25-27, St. Paul, Minn. – The International Forum of Control Data Users (Focus) Spring Meeting. Contact: William I. Rabkin, Focus/International, c/o Itek Corp., 10 Maquire Road, Lexington, Mass. 02173.

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ALL WITH IBM M/A

(also 7330, 1311, 729 drives)

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Will purchase all types of unit record equipment now with or without IBM M/A

DPMA Showing Film on DP Field

PARK RIDGE, Ill. – A 16mm color-sound educational film about the computer and the information processing industry, entitled "Man's Most Magnificent Machine," has been produced and is being distributed by Data Processing Management Association (DPMA).

The professionally produced 20-minute film is intended for a general, non-technical audience to further knowledge and appreciation of the computer and the EDP industry.

Among the areas covered in the film are job opportunities in the EDP field and the computer's role of increasing importance in industry, schools, medicine, finance, transportation, the professions, and many other fields.

Prints are available at $95 to DPMA chapters, members and member companies, and $105 to non-members. Write to DPMA International Headquarters, 505 Busse Highway, Park Ridge, Ill. 60068.

Societies

McGovern Elected

NEWTON, Mass. – Patrick J. McGovern, president of International Data Corp. (IDC), and publisher of *Computerworld*, has been elected to the board of directors of the Information Industry Association. McGovern will serve a one-year term.

The Information Industry Association is a two-year-old association of corporations and firms involved in some aspect of the information or information processing industry.

D.P.M.A. 1970

(Data Processing Managers Association)

is coming

June 23, 24, 25, 26 in Seattle, Washington and COMPUTERWORLD will be there. COMPUTERWORLD will cover this important User get together with 2 issues.

D.P.M.A Preview Issue out the week before the show

issue date: June 17, Advertising Forms (black & white) close June 5. Color Forms close May 29.

D.P.M.A. Show issue out at the show

issue date: June 24th, Advertising Forms (black & white) close June 12th, Color Forms close June 5th

5,000 Bonus issues distributed at the show to the attendees.

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Preview Issue—June 17
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We are looking for really talented, versatile programmers to join our teams, located in or near London or in the Manchester or Edinburgh areas.

If you are interested, we would like to tell you more. Please write us giving particulars of your education and experience. Interviews in major American cities with our senior management representative will be arranged shortly. Address your inquiry to Mr. David Camidge, ICL, 555 Madison Avenue, New York, New York 10022

BUSINESS **COMPUTERWORLD** INDUSTRY

May 13, 1970

Credit Bureau Sings the Blues

By Harvey Elman
CW Staff Writer

DENVER – You think that you have troubles? Listen to the woes of the Denver Retail Credit Men's Association.

At its recent annual meeting, the group was informed that the project involving computerization of the Credit Bureau of Greater Denver is bogged down due to lack of sufficient funds.

Lloyd M. Jensen, committee chairman, reported that "we ordered an IBM 360/30, and then found it wasn't big enough, and a 360/40 was required. But a Model 40 costs so much we couldn't justify using it."

"Then we tried the service bureau route, and found they wanted to charge as much as the Model 40 costs, plus a return on the investment because it couldn't be used on a part-time basis.

"Now we are hearing proposals from five other firms, and hope to make a recommendation within 60 days."

"Computerization," said Don Puffer, executive vice-president, "involves conversion of three-quarter million files including legal actions, court decisions, employments, and the experiences of merchants and bankers in customer relations.

The Model 30, he felt, did not possess sufficient mainframe to handle credit reporting of this magnitude. The 40, he continued, was turned down solely for economic reasons.

"We must be on-line," he said, "to keep the very latest credit ratings and reports up-to-date. This is not a time-sharing environment."

Pentagon DP Budget Restrictions Hamper Navy Plan for Increase

By Edward J. Bride
CW Staff Writer

QUONSET POINT, R.I. – The current severe budget restrictions being imposed by the government have brought to an "almost complete halt" the "orderly planned increase in the use of data automation throughout the Navy," a high-ranking Navy official said recently.

Rear Admiral Roger W. Paine, head of the Navy's Information Systems Division, said that separate dollar ceilings for data processing had been imposed on each "major claimant," or intermediary between the individual activity and the top echelon.

Data processing has thus been singled out as a special area of concern, Paine said, adding that "I feel that continuation of separate control of ADP expenditures would be unfortunate."

He said that, with continued financial restrictions, the Navy "may be forced into" continued separate control for fiscal 1971.

The admiral was speaking to about 350 military and civilian attendees at the second annual seminar sponsored by the Newport Naval Base Data Processing Advisory Group.

The group is actually composed of members from all Naval Activities on the Narragansett Bay.

The seminar was conducted at the Officers' Club of the Naval Air Station, and the theater at the nearby Construction Battalion Center in Davisville.

DP Budget Scrutiny

Despite the current scrutiny given to DP budgets, the admiral said that commanders should funnel money into ADP programs if such an action would "effect significant benefits or savings in another area."

He added that a commander should not be "inhibited" from such rechanneling of funds "merely because data processing dollars come out of another pocket."

Paine referred to a recent memorandum from Deputy Secretary of Defense David Packard [CW, April 29], which prohibits implementation or expansion of most DP systems until critical reviews have occurred.

Noting that DP is "no longer a sacred cow, for which new money is available based on innocuous and vague statements of need," Paine called on Navy commanders to provide "fully documented studies" to support ADP requirements.

To meet the need of documentation, Navy officials "will be looking to you – the actual users of ADP," Paine said, adding, the Office Equipment Division of pared, I suggest you take steps in that direction."

More Useful Information

The two-star admiral provided policy guidance for system designers, calling for integrated data bases to support "not the clerks, but the principal planners and decision makers" in the Navy.

He suggested that managers "assure that your data processing department are not merely large processing organizations, but are in fact providing useful information to you and the key elements of your staff.

He said that the problem of complex systems and systems analysts and programmers of "lower quality levels" deserves special attention "because you cannot expect to develop and maintain effective systems without talented analysts and programmers."

Paine also cited over-ambitious objectives or ill-defined goals as a source of problems, noting the "tendency of the ADP vendors to promise more than can be delivered."

Without naming any Navy vendors, the admiral noted the recent problems of United Air Lines, which recently cancelled a $39 million contract with Univac for an on-line management system to control reservations, scheduling, maintenance, and other airline-related functions.

Other speakers in the seminar pointed at the United-Univac deal as a classic failure of vendor and customer to communicate needs and project problems.

As Paine explained, "management was oversold on what ADP could deliver."

Wells Fargo Installs SD-550 Microfilm System to Speed Up Customer Service

SAN FRANCISCO – A microform information storage and retrieval system to serve customer account inquiries was unveiled here at the Wells Fargo Bank's credit card operations center.

The SD-550 Information Retrieval system, developed jointly by Diebold Inc. and Sanders Assoc., maintains hundreds of thousands of customer account records on microfilm. Any one of these records may be transmitted to a remote closed circuit TV monitor in an average of 20 seconds from time of request.

"The new system," according to Watson M. McKee Jr., vice-president of Wells Fargo's DP department, "gives us almost instantaneous access to any Master Charge customer file."

150 Inquiries

"We are currently receiving an average of 150 customer account inquiries a day," McKee said. "We are now able to solve a possible account problem in a matter of minutes, while a customer is waiting, rather than run an account check manually through our previous system which took considerably longer."

Wells Fargo Bank is the first financial institution in the nation to use the SD-550 system, according to W.K. Wilson, vice president and general manager of the Office Equipment division of Diebold.

Six Transmitter Stations

The system consists of six microform transmitter stations, four Diebold 6600 series mechanized files and 15 remote desk top viewing monitors.

When a customer calls the customer service department with a question about his credit card account, the respondent merely calls the account number to the central filing source and, in seconds, the complete file in question is transmitted to the viewing monitor.

At the filing source, account records are microfilmed and stored in customer jackets by branch and account numbers. Both color and notch coding are used for faster retrieval and to preclude misfiles.

Push Button

The mechanized files used to store the records have coded push button controls for still easier access to the proper filing tray. Each file presently houses over 100,000 separate account jackets, offering expanded storage capacity for several years of growth without adding additional equipment.

As a filing operator receives an account number request, she retrieves the customer's jacket, inserts it into the transmitter and presses the identification number on her transmitter keyboard of the remote monitor which is requesting the information. The picture and control functions are automatically transferred to that remote terminal.

Each remote viewing monitor has controls for focusing, zooming in or out, scanning left to right, or up and down and for fine positioning.

Total File Integrity

In addition to fast retrieval features, the SD-550 provides total file integrity since the original microform never leaves the central file source. Here a reader-printer furnishes original size copies of an individual document or chip. Where the entire file of a customer is required for lengthy viewing on one of the microfiche viewers in the various departments of the bank, a Diazo copy is furnished of the complete original jacket. The original central file jacket is thus kept inviolate.

All new account information containing name, address, and account number is stored in the bank's computer. To insure accuracy a COM film chip is produced and compared with the original microfilmed copy of this source data in the jacket. When verified as accurate, this COM chip is also inserted into the customer's microfiche jacket.

The SD-550 system is the second development in a cooperative program between Diebold and Sanders Associates. The first system introduced in 1968 is the SD-500, providing fully automatic retrieval, transmittal, and refiling from an unattended repository.

Farrington Settles Patent Challenge

SPRINGFIELD, Va. – Farrington Mfg. Co. has resolved a long-pending interference challenging one of the company's basic patents in the character recognition field.

This interference, initiated 10 years ago in the U.S. Patent Office by Character Recognition Corp. (now a wholly owned subsidiary of the Singer Co.), has been settled by the parties. Under this agreement, Farrington gains clear title to all claims of its U.S. Patent No. 2897481 and Character Recognition Corp. and Singer are licensed under certain of the claims of the patent.

Peter F. McCloskey, Farrington's president, said: "The resolution of this interference has eliminated the obstacle confronting Farrington in enforcing this basic patent. IBM and Control Data Corp. already have licenses and this settlement will enable the company to pursue a vigorous licensing program with other manufacturers of optical and magnetic character recognition equipment."

RCA Rises in Single Source Leasing, Teleprinter, Terminal Maintenance

NEW YORK – RCA has taken an increasingly strong position within the past year as a single source supplier of leased teleprinters and terminal equipment and the required installation and maintenance services, according to Robert F. Adams, division vice-president of technical products service for the RCA Service Co.

More than 15,000 teleprinter units and associated peripheral equipment are currently being serviced by the company. "We pride ourselves in maintaining a high degree of flexibility in what we have to offer the customer," Adams said.

Total Package

As outlined by Adams, RCA offers a total package which includes leased Teletype Series 33 equipment and nationwide installation, preventive maintenance, and remedial service. Users who already have equipment are offered maintenance services to meet their specific needs on a local, regional, or national scale. The service is available by contract or on a per-job basis.

Equipment for leasing includes Teletype Model 33ASR with tape perforator and reader and the 33KSR to transmit and receive data in the form of page copy over short or long distances. Telephone couplers, data sets, and private line connecting equipment are also available on lease.

"Other than the common carriers," Adams said, "we have the largest nationwide field service force skilled in teleprinter maintenance."

The company technicians, who receive specialized training in teleprinter and peripheral equipment maintenance, are in 130 principal cities throughout the continental U.S.

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Rent a Data-Lab and Get A Do-It-Yourself Computer

HOUSTON – "Something between a service bureau and a coin-operated laundry" is how Ned Snead, president of Snead Management Systems Inc., describes Data-Lab, a do-it-yourself computer room operated by his firm.

The lab is rented, by the hour, to medium-to-small-sized businessmen who need a computer, but not full time. The cost ranges from $5-$25/hr.

Two more Data-Labs are scheduled to open this month in Austin, Texas, and Indianapolis, while a fourth is planned for late this year in Dallas. Twelve people are employed in the Houston lab.

Presently, Data-Lab houses an IBM 1130, a System/3, a keypunch, and a card sorter.

Snead Management, which helps firms set up their programs, teaches the employees how to run it, then rents them computer time in Data Lab to do their own work.

Users have a place to lock up confidential data if they wish, said Snead. "We feel an owner or his employees, the people who really know the business and know an error when they see it, can control every step of the process themselves and save not only time but money," he added.

Data-Lab operates on a 24-hour basis, with the "graveyard shift" on a much reduced rental. Snead noted that a man trying a new program, or one short of cash, can come in at midnight, if he chooses, to take advantage of the lower price.

Trade Shorts

PHI Computer Services Inc., Arlington, Mass., has received delivery of an Ampex RM-65 extended core memory for on-line, plug-to-plug operation with its IBM 360/65 system.

Eugene E. Prince, Ampex Corp. vice-president and general manager, computer products division, said use of the memory enables PHI to process data nearly three times faster than would be possible with other methods. Cycle time of the 360/65 is 2.8 μsec, compared with 8 μsec cycle time of IBM large core storage units.

A subsidiary of Wang Laboratories, PHI uses the 360/65 for a wide variety of EDP applications, including a major new information storage and retrieval service.

American Express Co. is building a $6.5 million computer center in Phoenix. Despite bringing 2,000 new jobs and a $10 million payroll to the area, the plant was planned amid opposition from nearby homeowners, a threatened lawsuit, and a negative vote from the planning commission.

Brandon Applied Systems Inc., New York, has agreed to allow its software package, Resource Management Systems (RMS), to be sold under license in Canada by AGT Data Systems Limited, a Toronto-based software company.

This is the first license agreement for the package, which is sold in the U.S. and Europe by Brandon and its subsidiaries. RMS is a modular package which helps managers to control operations by scheduling personnel and equipment, and to control developmental projects.

General Computer Systems Inc., Dallas, has arranged with Cavanaugh Computer Leasing Corp., N.Y., to provide leasing programs for its System 2100 computer-controlled keyboard EDP input system.

Versatec Inc., Cupertino, Calif., recently introduced a completely new line of six different non-impact, electrostatic hard copy output devices. These products, designated the Matrix series, are designed for use with mini and midi computers, CRT terminals, and high-speed transmission lines.

Computer Optics Inc., Bethel, Conn., has signed an OEM marketing management consulting agreement with Data Motivation Inc., Park Ridge, N.J., for the Computer Optics lines of electronic data display systems. Data Motivation specializes in establishing OEM sales and marketing programs for the EDP industry.

Burbank, Calif. has terminated a $115,000 contract with Lockheed Missiles & Space Co. for DP consulting services and postponed for at least a year the use of leased commercial computer services to replace its own system. City manager Joseph N. Baker said the agreement was cancelled due to rising costs of commercial services and as part of a move to strip the city's 1970-1971 budget.

Four undergraduates at Case Western Reserve Univeristy have formed a new corporation, Consultants in Computer Technology, to offer specialized software computing services exclusively to institutions in the local Cleveland area. The company has rented time on the Univac 1108 in University Circle Research Center.

Informatics Inc., Sherman Oaks, Calif., has received a $5 million cost-plus-fee supplemental agreement award from Nasa.

The award represents a supplemental agreement under an existing contract with Informatics Tisco, an Informatics' wholly owned subsidiary, for a one-year continuation of the operation of the Nasa Scientific and Technical Information facility in College Park, Md. Tisco helps to acquire, organize, and distribute world-wide scientific and technical reports in the space, earth, and life sciences.

CDC's new office building in Bloomington, Minn., will house the company's headquarters when completed in mid-1971. Total cost of the construction now under way is expected to be $12 million to $15 million.

A. The Devonshire from Devonshire it'll make a name for itself

(This is the answer. Turn page for question.)

Entrex to Manufacture,Market ,Service Full Hardware and Software Systems

LEXINGTON, Mass. – Electronic data processing equipment that simplifies and improves communications between computer systems and their human users is the goal of Entrex, Inc., a new corporation based here.

Entrex, Inc. has been formed to manufacture, market, and service complete EDP systems (hardware and software).

The new company's equipment talks to computers at electronic speeds and talks to its operators in their language by displaying information in English on television-like screens.

New Companies

The company's first product is a line of data entry equipment called the System 480. Featuring it's own computer and disk, it controls up to 64 Data/Scope keystations, letting every operator see the error-free data she is recording for computer-processing. The Data/Scope features a 480 character display.

The System 480 is primarily for preparing computer input, and is designed to replace existing keypunch and key-to-tape methods.

Other New Companies

★ System Architects, Inc. (SAI) has been formed in Braintree, Mass., to specialize in real-time computer system simulation communications network optimization and advanced information system data base development activities.

Under an agreement with Interactive Sciences Corp. (ISC), all existing activities in the Management Sciences Division of ISC were to be transferred to SAI.

SAI currently is under contract with the Library of Congress, Westinghouse, and The Pillsbury Co. as consultants.

★ Hefte Industries, a newly formed company in San Jose, Calif., will supply sales representation on the West Coast to manufacturers of computer peripheral equipment.

Hefte Industries will initially concentrate its efforts in graphic data input and output equipment, digital incremental magnetic tape recorders, data communications equipment, and data terminals.

In addition to conventional direct sales representation for its clients, Hefte Industries will produce and distribute catalogs and direct mail sales promotions to its own California customer list.

★ I/O COM, Inc. has been formed in Sunnyvale, Calif., for the purpose of developing, manufacturing, marketing, and service data terminal and communications equipment.

"Automatic monitoring systems with unattended communications to a central computer present an area of active interest, and we believe that our first product will satisfy some of the requirements of this market," W.L. Loveless, president of the new company, said.

★ Rx Systems, Inc., has been formed to offer computerized packages and services in the medical care field.

The initial product line will consist of an automated general medical history to be offered on Rx Systems' programmable CRT terminals during patient interview, with instant playback or printout in doctors' offices, hospitals, private clinics, and other users. Subspecialty medical histories will also be made available.

★ Decision Data Corp. (Warminster) unveiled its capabilities and marketing plans for a complete line of 96-column data preparation and peripheral equipment.

The company intends to offer the computer industry an alternative and an accessible source of supply for 96-column equipment.

The company offers a full 96-column product line including data preparation equipment, auxiliary units, and peripheral I/O equipment. Initial customer deliveries will begin in October with preproduction units available sooner.

Decision Data's product plan does not include 80-column punched card equipment.

Contracts

A large research and development contract for computer peripheral equipment has been awarded to the Electronics Division of Ferranti-Packard Ltd. by Spiegel Inc., of Chicago.

Santiago Library System, cooperative of Orange County, Calif., has awarded a contract to Century Information Sciences, Inc. of Los Angeles, to conduct a book catalog feasibility study. The study will be utilized as a tool for determining how individual member libraries will merge their catalogs into the Biblios data base.

A comprehensive data bank on air cargo potential for the immediate future will be the first project of a new joint venture being formed by Mathematical Applications Group, Inc. and Transportation Research and Computer Systems, Inc.

Cadcom, Inc. was awarded a contract by the U.S. Maritime Administration to develop five ship design programs to be run on the CDC-6600 computer.

Ampex Corp. has received contracts exceeding $450,000 from Recognition Equipment, Inc., to supply Model TM-7 digital tape drives.

Microform Data Systems, Inc. has received a facility management equipment and service contract for an ultra-high density film processing system from the Mellonics Systems Development Division of Litton Industries. The values of the equipment exceeds $300,000.

A sale of Vadic VA 300 series of modems to Novar Corp. will be utilized in Novar's Model 5-50 business data communications terminals.

Bailey Meter Co., Wickliff, Ohio, will manufacture and supply systems for Pacific Power and Light Co.'s Dave Johnston Generating Station in Glenrock, Wyo. The terms of the contract were not disclosed.

Shipping Research Services A/S Ltd., Oslo, Norway, has signed a contract with Chantiers Navals de la Ciotat, France, for delivery and installation of Autokon, a system for design and construction purposes in the shipbuilding industry.

Systems Engineering Corp. has been awarded a contract by the National Education Assocation for the development of a new state education association membership system.

Tracor Computing Corp. has made an agreement with Computer General Corp. to begin using CG's operating system supplement, PowerPak, to increase the throughput capabilities of TCC computers at its Washington D.C. branch office.

Computer Congenerics Corp. has been awarded a five-year contract with the Fourth National Bank of Tulsa to perform all data processing services for its bank, its correspondent banks, and their customers.

The R.F. Systems Group of Fairchild Space and Defense Systems has received a contract for $1.3 million from the U.S. Army Electronics Command at Fort Monmouth, N.J. The contract is for design development and fabrication of seven engineering test/serve models of the AN/ALQ-67 countermeasures set, seven flight line test sets and attendant documentation and support items.

Lockheed Electronic's Data Products Division has been awarded a contract in excess of $500,000 for memory systems in a submarine sonar program. The Submarine Signal Division of Raytheon Co., Portsmouth, R.I., will purchase Lockheed's CR-95 military memory.

Computer Micrographics, Inc. has been awarded a contract by the U.S. Navy to improve present information storage and retrieval methods.

A $100,000 contract has been awarded to Dataline, Inc. by Nu-Concept Computer Co., for three preproduction-model card printers and three preproduction model line printers.

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Orders and Installations

Systems Engineering Laboratories, Inc., Fort Lauderdale, Fla., received orders totaling more than $1 million from Bell Telephone Laboratories and a major public utility in the Southwest for the new Systems 86/88 computers.

Bell Labs of Naperville, Ill., will use the Systems 86 to simulate hundreds of thousands of phone calls for the development testing of future toll electronic telephone systems. The city public service board of San Antonio will install a Systems 88 computer to monitor and control two large turbine generators that provide electric power to the utility's 240,000 customers.

Centre — National – d'Etudes Spatiales (CNES) Bratigny, France, installed a Control Data Corp. 6600 system, valued at $5.7 million, to handle all of the scientific and administrative computing needs of CNES for the 1970s. The CDC 6600 is processing administrative data and analyzing research and development, telemetry and satellite tracking data.

Data Products Corp. of Los Angeles has received a $600,000 order from Hewlett-Packard Co., Cupertino, Calif. The order calls for Data Products' miniprinters, Model 2000 Series, to be used in conjunction with the Hewlett-Packard line of digital computers.

The Federal Institute of Technology (ETH), Zurich, Switzerland has purchased a CDC 6400 and a 6500 computer and four 1700 computers to build a massive computational system for research, student training, library applications, and administrative data processing. The value of the system is $5.6 million.

An IBM System/3 has been ordered by Benham Corp. of Scottsboro, Ala., for inventory control and payroll processing.

Communications Logic, Inc. of Houston has been awarded an order from On-Line Systems, Inc. of Pittsburgh, Pa. for two communications interfaces for the PDP-10. On-Line Systems will provide the necessary software for the communications hardware that has been sold to Graphic Controls Corp. of Buffalo, N.Y. Total value of the order is in excess of $200,000.

The U.S. Army Corps of Engineers has ordered a General Electric GE-Pac 4020 process computer to be used for hydroelectric power system control in The Dalles Dam, Washington.

Computer Consoles, Inc. (CCI), Rochester, N.Y., has shipped two data terminal units to Philips Broadcast Division of No. American Philips. Philips will incorporate the CCI equipment into a computer system for modernizing the Federal Aviation Agency's air traffic control program.

An IBM 1288 optical scanner which takes data from typed and hand-printed forms directly into electronic computers has been installed by First-Union Automation Services, Inc., St. Louis, Mo. The unit will process insurance claims, personnel testing scores, charge account statements and sales slips for inventory control and sales analysis.

Control Data Corp. of Minneapolis, Minn., will supply data processing equipment at the Air Force Cambridge Research Laboratories. The lease and maintenance cost of the equipment for one year is about $1,792,476. Acquisition of the equipment will be through an Air Force contract.

CDC Gets Dual 6600 Systems Contract

MINNEAPOLIS, Minn. – Control Data Corp. has been awarded a contract for dual 6600 super-computer systems, valued at about $7 million, from MIT's Lincoln Laboratory at Lexington, Mass.

One of the two identical systems will be installed this June in the Lincoln Laboratory in Lexington and the other system will be installed at the Kwajalein Missile Range in the Marshall Islands early next year.

The 6600 at Kwajalein will be connected to radar systems and will send data to and receive it from the systems for real-time data processing and control. The 6600 at Lincoln Laboratories will be used for program development and for similar data processing. However, the data inputs will be simulated.

The Kwajalein computer system will be connected to three radars (each of which has its own computer) and to an additional computer which is connected to and controls the operation of the radars as a group. There are seven computer-to-computer links; each link is a two-way, 100,000-bit/sec serial link.

Computer Sets Real Estate

ST. LOUIS, Mo. – A computer was used by the Mayer Co. to determine selling prices of five types of homes in the company's newest development.

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It's made especially for the mini- or midi-computer and CRT terminal user who can't stand the inefficiency of a 30 line-per-minute impact printer.

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MATRIX 300 delivers 400 characters per second for $5,500.

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The printer is silent, highly reliable, and produces records of excellent quality. Graphics capability is offered. MATRIX SERIES printers and plotters also find applications in time sharing, batch processing and non-EDP communications.

Output is printed as perfectly formed 5 x 7 dot-matrix characters in 80 columns on 8½ inch wide paper.

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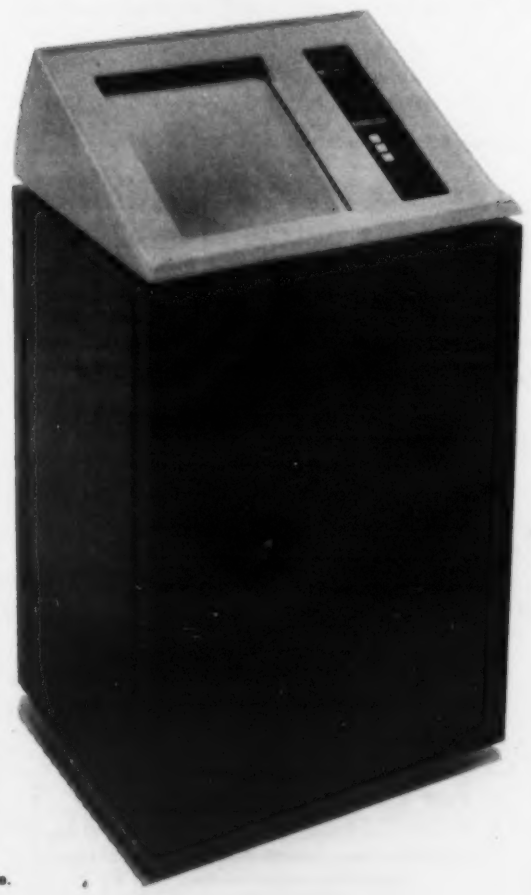

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Daedalus Expands Again With New Plant

NORTH SYRACUSE, N.Y. – Daedalus Computer Products, Inc. has started a second major expansion of manufacturing facilities within a year. The firm is building a new 25,000-sq-ft plant to accommodate increased production requirements, in Daedalus/Park, a 34-acre development north of Syracuse. In October, 1969, Daedalus, a manufacturer of programmable data terminals, opened its first plant in the Park, a 10,500-sq-ft production center.

The company's employment has risen from 20 persons to over 80 within the year. According to Robert D. Jenkins, president, Daedalus' new plant will be devoted exclusively to the production of its Model 711 terminals and I/O optional peripheral devices.

H.L. Blachford, Inc. has

Expansions

Other Expansions

opened a manufacturing/sales facility at 1450 N. Glassell St., Orange, Calif. 92667. H.L. Blachford produces a variety of noise control materials, including Baryfol and Aquaplas laminated and one-piece liners and insulating mats for the automotive, computer, agricultural, and other industries.

Lykes-Youngstown Computer Services Corp. has opened its Cleveland operating center in the Centerline Building, Villaview Road. The Cleveland center is the fourth operational center to be opened; other centers in operation are in Atlanta, New Orleans, and Tampa.

Computer Language Corp., Jacksonville, Fla., has changed from an operating corporation to a marketing and management corporation for the purpose of establishing a nationwide system of computer training schools. The management corporation will move into new offices in Jacksonville and will provide assistance in the areas of marketing, management, curriculum development, and advertising for the nationwide affiliates.

Smyth Business Machines, Inc. of Canton, Ohio, is opening its second branch office in Hartford, Conn. The corporation, with its home office in the North Canton Industrial Park, will set up a computer service bureau better to serve retailers and professionals on the Eastern seaboard.

Computer Optics, Inc. has opened a new regional sales office in the Lincoln Building at 60 East 42nd St., New York, and an office in the Wells Fargo Building, Del Amo Financial Center, Torrance, Calif. Computer Optics specializes in the research, manufacture, and marketing of advanced computer-derived electronic display systems for information retrieval, editing and distribution.

Information Control Corp. has transferred all its facilities to one location in a new facility at 9610 Bellanca Ave., Los Angeles.

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The LSI circuit made possible a "computer in a suitcase."

The MATRIX electrostatic printer has created the MULTIPLUS high speed distribution system.

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Unlike impact printers, the greatest cost in a non-impact printer is the electronics and not the printout mechanism. Thus, MATRIX slave terminals can be made available for $3,000 each or less depending on quantity. The master printer, alone, contains most of the electronics.

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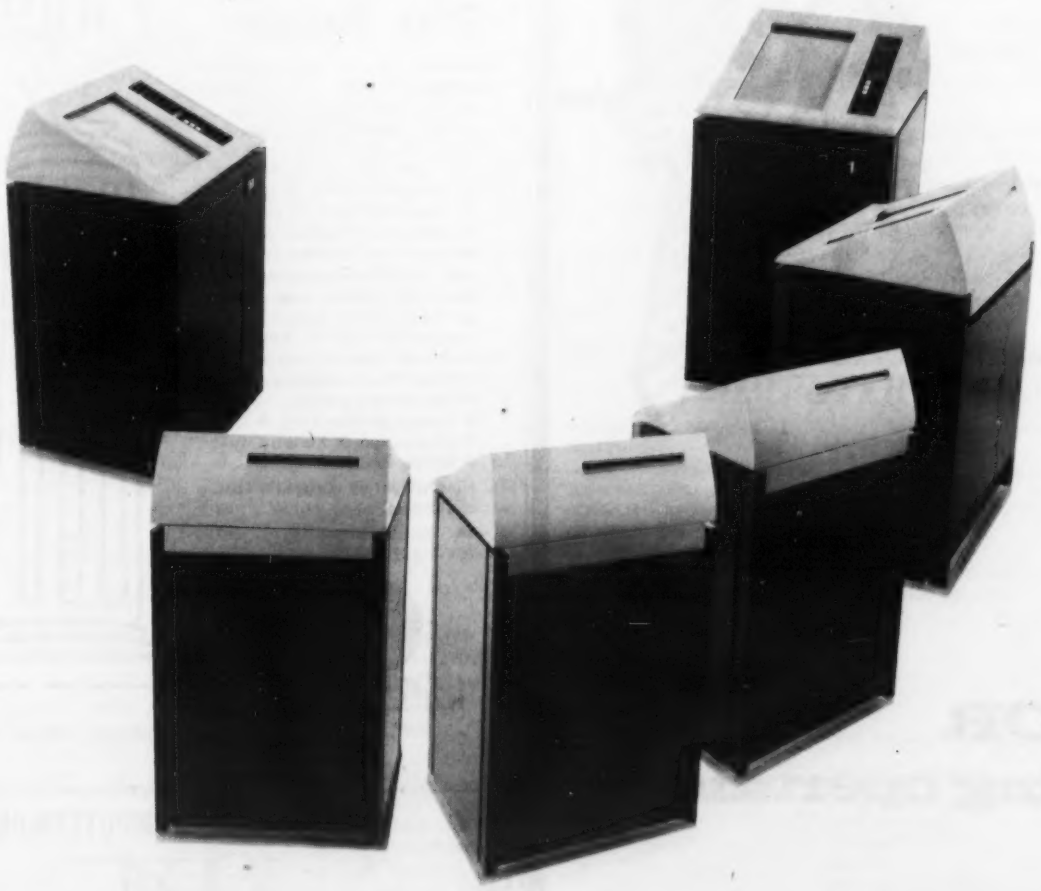

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3 IBM Executive Promotions Announced

ARMONK, N.Y. – Three executive promotions have been made at IBM.

Advanced to the company's management committee was Dean R. McKay, an IBM vice-president, while Wallace C. Doud and Ralph A. Pfeiffer Jr. have been elected vice-presidents of the company.

McKay had been in charge of the corporate operations and services staff. Functions formerly reporting to him will now report to Doud and Pfeiffer.

Doud, now vice-president, services staff, will have reporting to him the executives in charge of administration, communications, personnel, real estate and commercial development, industry relations and standards, as well as the IBM secretary. He had been IBM director of commercial development.

Pfeiffer, now vice-president, operations staff, will have reporting to him the executives responsible for manufacturing, marketing and service, and engineering programming and technology. He had been IBM director of marketing.

McKay joined IBM in 1946 and subsequently served in several sales and managerial posts before his promotion to regional sales manager for the Electric Accounting Machine Division in 1955. After serving as director of personnel for the Data Processing Division and IBM director of communications, he was elected IBM vice-president, communications, in 1961. He was promoted to his former position in 1969.

Doud came to IBM in 1948. He held a number of sales management posts before his promotion in 1959 to assistant director, commercial development. In 1965, he was advanced to director of commercial and patent relations for the corporation. He was promoted to his former position in 1969.

Pfeiffer, who joined the company in 1949, advanced through positions in sales and management before becoming corporate manager of market planning in 1961. In 1963, he was promoted to Data Processing Division vice-president and manager of the division's regional marketing operations in Washington, D.C. He was promoted to his former position in 1969.

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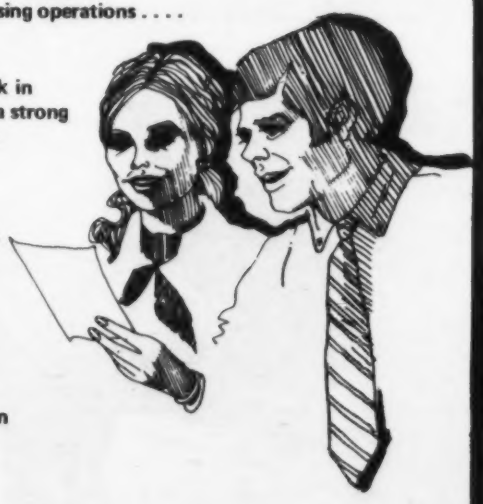

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Cognitive Names Rector a Vice-President

LOS ANGELES — Dr. Robert W. Rector has joined the staff of Cognitive Systems, Inc. as vice-president, corporate operations.

Rector previously was vice-president, corporate relations and plans and programs at Informatics Inc.

Prior to his six years with Informatics, he was assistant director, Computation and Data Processing Center for Aerospace Corp.

Before joining Aerospace, Rector was for five years the administrative manager, Computation and Data Reduction Center for Space Technology Labs. He was also a professor of mathematics for the U.S. Naval Academy.

Rector was general chairman for the Fall Joint Computer Conference and is currently representative-at-large for the National Council for ACM, and treasurer of Afips.

Rector received his Ph.D. in mathematics from the University of Maryland, his M.A. from Stanford, and a B.S. from San Jose State College.

Magazin Named Qantel Marketing Vice-President

HAYWARD, Calif. — William J. Magazin has been appointed vice-president of marketing for Qantel Corp. Magazin joins Qantel from Information Systems Design, Inc. (ISD), Oakland, where he was national marketing manager responsible for computer time and terminals.

Prior to his association with ISD, Magazin was northern Calif. branch manager for Univac. In this position he was in charge of branch operations, including sales, systems and programming.

Magazin received a B.S. in business administration from the University of Calif., Berkeley.

Other Moves

■ Robert R. Schadt has been promoted to the position of assistant vice-president, marketing services, for Itel Information Products Division.

■ Harold L. Leone has been appointed executive vice-president of Computer Sciences Australia Pty. Ltd., an affiliate of Computer Sciences Corp.

■ Sheldon G. Forman has been named vice-president of Computer Requirements, Inc., New York.

■ William J. Bing has been promoted to vice-president of sales of Bresnahan Computer Corp. Edward A. Ahern, secretary, has been named controller and assistant treasurer.

■ James J. McTernan Jr., formerly assistant vice-president of the Penn Central Co., has been elected vice-president of finance and administration of the Communications Satellite Corp.

■ John A. Neal has been appointed a division vice-president of Auerbach Associates, Inc., the consulting subsidiary of the Auerbach Corp.

■ Dr. Roy E. Murphy has been appointed vice-president of Computer Usage Co.

■ Thomas L. Tarter has been named financial vice-president of University Computing Co.'s Applied Science Group.

■ Jack E. Halter has been elected vice-president of marketing for Signetics Corp., Sunnyvale, Calif.

Executive Corner

■ Willis D. Marsing has been appointed executive vice-president of Metacomputer Sciences, Inc.

■ Robert Wemple has been elected vice-president of Foto-ed vice-president of corporate development and product planning, and William C. Thompson has joined Foto-Mem as executive vice-president and general manager.

■ Joel A. Johnson has been named president and chief executive of Remote Computing Corp., Los Angeles, Calif.

■ Orlando R. Petrocelli has been appointed vice-president and publisher of Brandon/Systems Press, Inc.

■ Frank J. Deighan and Hayden A. Moore have been appointed vice-presidents of ITT Cable Division.

■ Edward J. Corcoran has been promoted to vice-president of marketing and Wayne Adams to vice-president of engineering of Search, Inc.

■ Willis V. Daugherty Jr. has been elected vice-president of operations for Information Services, Inc.

■ Henry R. Hillenmeyer has been elected president of Computer & Business Management Inc., Cleveland. Hillenmeyer was previously vice-president, administration of the computer leasing and educational concern.

■ Applied Data Research, Inc. (ADR), Princeton, N.J., has named John R. Bennett as president and chief executive officer. Bennett joined ADR as manager of its Washington D.C. office in 1966, and since 1968 has served as corporate vice-president of marketing. Kenneth H. Cowan was elected vice-president of product marketing. Cowan was a founder and officer of Data & Information Products, Inc., a wholly owned sales subsidiary of Applied Data Research.

■ Harry S. Gaples has been named president of Melabs, Inc., Palo Alto, Calif. Melabs is a subsidiary of SCM Corp.

■ T.E. Brady, vice-president of finance and administration, has been elected president of FabriTek. He joined the company in 1967 as chief financial officer.

■ R. William Grenier has been appointed vice-president, marketing of Comma Corp. In his new position he will be responsible for coordinating the company's marketing and sales operations.

■ Applied Technology, Palo Alto, Calif., has named John L. Grigsby senior vice-president; William E. Bolton, vice-president of marketing and business administration; and James L. Gemmell, vice-president of finance and information. Charles F. Zumba will replace Grigsby in his former position as vice-president and chief engineer.

■ Joseph F. Earley has joined Trilos Associates Inc. as vice-president. Earley will be responsible for marketing as well as other general management areas.

■ Francis A. Meurer has been promoted to vice-president of Service Associates Inc. Meurer will be responsible for establishing and coordinating branch offices of SAI to provide repair and maintenance service teletypewriters and small digital electronic equipment.

■ Richard R. Douglas has been named vice-president and general manager of Honeywell's Information Services Division. The division offers six kinds of data processing services including remote and local batch processing, time-sharing, contract software, consulting, and facilities management.

■ Leslie L. Neumeister has been named vice-president of systems development at GT&E Data Services Corp., where he will be responsible for creating the detailed design and required operation procedures for proposed commercial computer applications.

■ Charles L. Crawshaw has been appointed vice-president, manaufacturing at On-Line Computer Corp., Stamford, Conn. Crawshaw was director of manufacturing at Fairchild Camera and Instrument Corp.'s Systems Technology Division.

User Update

Gordon B. Clarke has been elected senior vice-president of Greyhound Computer Corp.

Joseph Judenberg has been promoted to systems planning officer for the Chase Manhattan Bank, N.A.

John A. Gosden has been elected second vice-president, technical support group, of the Equitable Life Assurance Society of the U.S.

Wayne T. Castleberry has joined Crocker-Citizens National Bank as vice-president and manager of data processing and systems administration.

Cities Service Oil Co. has named Dr. Curtis A. Collins senior technical advisor in the general engineering division.

Kraft Foods has appointed David C. Melroy manager of systems development and John P. Laubach manager of technical servies.

Philip V. Caltabiano has been named a systems director for Worlco Computer Management Systems, Inc.

John Tierney has been appointed vice-president of marketing at Automatic Data Processing of Chicago. Richard H. Hannes has been appointed vice-president of marketing for Automatic Data Processing of Los Angeles.

New England Life Insurance Co. has appointed Roger J. Montalto director of data services in the systems development and data services division.

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Applied Logic Lays Off 40% of Workers, All in R&D

PRINCETON, N.J. – Faced with a net loss of $1.4 million for the six months ended March 31, Applied Logic Corp. has laid off 40% of its employees.

About 100 of Applied Logic's 260 employees were told that by the end of April they wouldn't have jobs anymore. They were laid off with two weeks' severance pay, and an Applied Logic spokesman said that the company's personnel department has been working "feverishly" to help relocate them.

The cuts came in the research and development area, but the marketing force was left intact. In addition to engineers and technicians, Applied Logic laid off about one-third of its programmers.

According to company President James R. Guard, "in order to reduce operating costs without impairing our growth in operations and marketing capabilities . . . development projects from which revenues were not shortly attainable [have been] delayed or eliminated."

Guard added that "other functions [were] consolidated into a more effective mode of operations."

Still Hiring Salesmen

The development projects involved hardware for the A1/Com time-sharing system. A company spokesman noted that Applied Logic was still hiring salesmen.

Guard noted Applied Logic's six month figures, which showed revenues up to $1,499,426 from $1,201,000 for the same period in 1969, while revenues dropped from $21,179 in 1969 to a net loss after taxes of $1,396,245. The per share loss came to 62 cents compared to a one cent profit in 1969.

An industry source said that the layoffs were caused by a severe cash flow problem stemming from Applied Logic's inability to finance two new time-sharing computers. Normally Applied Logic arranges a purchase-leaseback contract with a financing firm for its AL 10s.

The AL 10 is a dual PDP-10 with a special configuration of peripheral equipment. Currently the company has four of the units operating to provide time-sharing services, while two more are nearing completion.

The figures Guard mentioned were revised from figures the company released the week before. The revision constituted an increase of $250,000 in bad debt reserves. The company also noted that revenues from the time-sharing service had increased 85%.

An Applied Logic spokesman said that the company expects a "steady increase" in revenues from the six service centers. He also noted that Applied Logic intends to continue marketing new applications packages for science and engineering in its time-sharing framework.

War Protestors Hit Honeywell Contracts; Annual Meeting Halted After 14 Minutes

MINNEAPOLIS, Minn. – Mobs and Mace are beginning to hit the annual meeting circuit.

This time it was Honeywell's annual meeting last week, where hundreds of persons protesting the company's weapons contracts forced Honeywell Chairman James H. Binger to adjourn the meeting after 14 minutes without conducting any business.

As soon as Binger stepped to the podium in a Honeywell cafeteria, he was shouted down by the protestors who demanded to nominate directors. Stating that management held proxies for 87.7% of Honeywell's shares, Binger adjourned the meeting, adding that anyone who wished to vote by proxy for directors or on the appointment of accountants could do so by mail.

Antipersonnel Bomb

One of the objects of the protest was the Rockeye bomb, an antipersonnel weapon. The bomb explodes, showering an area with canisters that are in effect smaller bombs. The canisters are time-fused so that they explode randomly.

When they do explode they spray tumbling, jagged pieces of plastic. Because of the tumbling, wounds from a canister are extremely damaging, and because of the time delay it is dangerous for medical teams to help the wounded.

In an advanced text of the speech he did not get a chance to read, Binger said that the protestors' charges that Honeywell made weapons designed to kill civilians is untrue. The antipersonnel bomb is designed for use against military targets, the speech said.

About 2,000 high school and college students marched on Honeywell at noon, two hours before the meeting. Three hundred of them managed to get inside the meeting.

The protest had been massively organized. The night before the meeting about 3,000 persons attended a warm-up rally at Macalaester College, hearing, among others, Jerry Rubin of the Chicago Seven, and Charles Pillsbury, who had tried to engage Honeywell in a proxy fight over the armaments contracts [CW, April 22].

Honeywell's security procedures at the meeting were stringent. Because of careful proxy checking, only 300 people, mostly protestors holding proxies, managed to get into the meeting. The meeting hall holds about 700.

Guard Uses Mace

Shortly after the meeting began, demonstrators outside the building began moving from the parking lot Honeywell had set aside for them, toward the main entrance of the building. A Honeywell guard, using Mace, stopped them at the door.

The crowd dropped back and several people began throwing rocks and beer bottles through the plate glass door. Apparently the only injury was to a Honeywell usher when some of the Mace drifted back into his face.

About 60 Minneapolis police wearing gas masks arrived, and formed a skirmish line to clear the entrance of demonstrators. The crowd then returned to its staging area in a city park and dispersed.

At a press conference, Binger said he was disappointed at the meeting's outcome, but that it was impossible to continue over the shouting and harassment. He said that company officials had met with representatives of the protestors and agreed to let them make nominating speeches.

'Forfeited Opportunity'

"We agreed to give them all the time they wanted, but they forfeited their opportunity," Binger said. He added that the protest would have no affect on Honeywell's continued production of war items.

Speaking of the Rockeye, he said: "We have been criticized because it isn't a humane weapon. But we don't see that this is really the question.

"As long as wars are inhumane all the instruments of war will be inhumane. There are no nice weapons," he said.

ADR First Quarter 'Very Disappointing'; Operating Revenues, Net Earnings Drop

PRINCETON, N.J. – Applied Data Research, Inc., a software and service company, has reported operating revenues for the first quarter ended March 31, 1970 of $1,352,777 and a net loss of $306,007 or 32 cents per share.

This compares with operating revenues of $1,499,230 and net earnings of $76,840 or 8 cents per share for the similar reporting period in 1969. Figures for 1969 have been restated to reflect the acquisition of Programmatics, Inc. which has been treated as a pooling-of-interersts for accounting purposes.

Commenting on the first quarter loss, John Bennett, president of ADR, told the annual meeting of shareholders that "our first quarter results were, obviously, very disappointing.

An analysis of the results of our operations attribute our loss to three factors:

1. Proprietary sales were $400,000 short of quotas. The primary reason for this was the slowdown in the economy which has resulted in postponing buying decisions.

2. A heavy investment in increasing the size of our sales force to more fully exploit our markets, which has increased sales expense in the first quarter by $100,000 over the last quarter of 1969.

3. As a result of our accounting policy of amortizing proprietary development costs prior to their completion, expenses in this category increased in the first quarter by $170,000 over the last quarter of 1969. In the first quarter of this year, amortization expenses for products not yet introduced to the market totaled $200,000.

"Although the first quarter results were not good, we feel that there are significant reasons to expect improvement. First, proprietary sales have shown a marked increase. Based on information we have to date, April sales are estimated to be $290,000. This represents a sales rate of more than double that of the first quarter.

"We also expect to be operating profitably during the balance of 1970."

L-T, Standard Prudential Acquisition Talks Off—No IBM Repayment Plan

NEW YORK – The latest plan to save Levin-Townsend Computer Corp. has fallen through.

Less than a week after L-T announced that it was negotiating to be acquired by Standard Prudential Corp., James E. Townsend, president of the troubled company, revealed that it was impossible for the two companies to find an acceptable plan for repayment of L-T's $11.2 million debt to IBM.

"IBM just wouldn't find any proposition acceptable" Townsend said.

Officers of the two companies had said earlier that before any final plans for merger could be made "an agreement is expected to be reached with IBM to its satisfaction . . ." concerning L-T's outstanding debt.

An IBM spokesman refused to comment on the negotiations. He said "IBM is following the matter on a day-to-day basis in an effort to collect the amounts due." IBM has postponed demanding payment on the outstanding debt since March 17.

Levin-Townsend had previously sought to merge with Boothe Computer Corp., but those negotiations were also called off because of the inability to solve the debt problem.

Townsend said his company was resuming negotiations to sell $50 million of computer equipment to an unnamed buyer. When he announced the talks with Standard Prudential he had said that purchase negotiations were being "temporarily suspended."

John M. Randolph, president of Randolph Computer Corp., acknowledged that he had had talks with L-T, but refused to confirm that Randolph was the purchaser L-T was referring to. Randolph is the computer-leasing subsidiary of Travelers Corp.

Standard Prudential owns Standard Financial Corp. and Sterling National Bank, both in New York, as well as other operations.

Levin has instituted court action to be reinstated as L-T's head, as well as a $750 million unbundling suit against IBM, and has announced plans for a proxy fight to regain control of the company he founded.

Graham Magnetics Sales, Earnings Show Increase

GRAHAM, Texas – Graham Magnetics Inc., manufacturer of precision computer tape, has reported a 34.5% increase in net sales and a sharp increase in net income for the first nine months of the current fiscal year.

The firm had net sales of $3,557,537 for the first nine months of the current fiscal year, compared with $2,644,651 for the comparable period a year ago. Graham Magnetics' sales for the first three quarters of the current year ended March 31, 1970 have already exceeded the full year's sales of $3,550,296 of the prior fiscal year ended June 30, 1969.

Net Profit

The nine months net profit amounted to $128,438, or 19 cents per share, which compares with a loss of $26,520 for the first nine months of the last fiscal year, George A. Jaggers, president, reported.

The company's strong sales performance stems from the increasing acceptance of Graham's products by the EDP industry, Jaggers said, and from continued strengthening of the firm's sales organization, both domestically and abroad.

Jaggers also reported that Graham Magnetics has effected a settlement with Scientific Control Corp. under which Graham has received 38,162 shares of Scientific Control stock. Graham holds an unsecured note from Scientific Control in the amount of $1 million.

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Earnings Reports

COMPUTER SCIENCES CORP.

Year Ended Mar. 27

	a1970	b1969
cShr Ernd	$.41	g$.53
Revenue	108,062,000	82,010,000
Spec Cred	.....	e387,000
Earnings	c5,260,000	f7,190,000

a-Preliminary. b-Restated to reflect acquisitions on a pooling-of-interest basis. c-After write-down of approximately $13,000,000 pretax, representing unrecoverable capital investment in Computicket Corp. e-Gain on sale of securities. f-Equal to 56 cents a share. g-Adjusted to reflect five-for-two stock split in June 1969.

ELECTRONIC MEMORIES & MAG.

Three Months Ended Mar. 28

	1970	a1969
bShr Ernd	$.10	$.19
Revenue	20,506,000	19,029,000
Earnings	706,000	1,107,000

a-Restated by company. b-Based on average common and common equivalent shares.

PACIFIC PLANTRONICS INC.

Three Months Ended Feb. 28

	1970	1969
Shr Ernd	$.06	$.19
Revenue	2,145,975	2,398,042
Earnings	47,825	230,229
9 Mo Shr	.73	.89
Revenue	7,166,467	6,451,247
Earnings	530,849	621,163

FOXBORO CO.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	$.14	$.08
Revenue	32,955,000	26,007,000
Earnings	602,000	346,000

MEMOREX CORP.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	$.54	$.38
Revenue	24,448,000	18,152,000
Earnings	2,008,000	1,397,000

APPLIED DATA RESEARCH

Three Months Ended Mar. 31

	1970	a1969
Shr Ernd	.....	$.08
Oper Revs	$1,352,777	1,499,230
Loss	306,007	b76,840

a-Restated to reflect an acquisition. b-Income.

CONTROL DATA CORP.

Three Months Ended Mar. 31

	1970	f1969
aShr Ernd	$.09	$.81
Revenue	125,539,000	131,730,000
bSpec Cred	30,000	4,618,000
cEarnings	1,678,000	16,572,000

a-Based on income before special credits. b-In 1970, consists of a gain of $237,000, less a loss of $207,000 from the sale of a minor foreign manufacturing subsidiary. In 1969, consists of a credit of $3,499,000, applicable to Commercial Credit Co., and a tax credit of $1,119,000 from loss carry-forwards of certain foreign subsidiaries. c-Equal to nine cents a share in 1970 and $1.13 in 1969. f-Restated.

BUNKER–RAMO CORP.

Three Months Ended Mar. 31

	1970	a1969
bShr Ernd	$.12	$.12
Revenue	61,532,526	62,054,332
Spec Cred	.....	c321,500
Earnings	2,837,277	e3,177,582

a-Adjusted to reflect pro rata, the provision for loss on the disposition of the former White Way Sign Division, effective Jan. 1, 1970, and to reflect pro rata, the recent changes in the income tax law for investment credit carryforward. b-Based on income before special credit. c-From tax loss carryforward. e-Equal to 14 cents a share.

DIEBOLD COMPUTER LEASING

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	$.10	$.09
Revenue	8,159,000	7,244,000
Earnings	382,000	427,000

On a fully diluted basis, per share earnings, as reported by company, were nine cents in 1970 and eight cents in 1969.

ACME–VISIBLE RECORDS

Six Months Ended Mar. 31

	1970	1969
Shr Ernd	$.91	$.96
Revenue	18,888,245	17,678,245
Earnings	1,004,207	1,050,431

COMPUDYNE CORP.

Three Months Ended Mar. 31

	1970	a1969
Revenue	$5,996,524	$5,900,891
Earnings	287,216	219,614
6 Mo Shr	.....	.....
Revenue	11,919,150	11,774,987
Earnings	334,570	317,651

a-Restated for acquisitions on a pooling-of-interests basis.

REDCOR CORP.

Nine Months Ended Mar. 29

	1970	1969
aShr Ernd	$.12	c$.10
Revenue	7,351,000	5,535,300
Tax Cred	54,000	40,000
bEarnings	206,000	141,000

a-Based on income before tax credit. b-Equal to 16 cents a share in 1970 and 13 cents a share in 1969. c-Adjusted to reflect two-for-one stock split in Dec. 1969.

DCS COMPUTER SERVICES, INC.

Three Months Ended Mar. 31

	1970	a1969
Shr Ernd	$.03	$.02
Revenue	203,872	143,502
Earnings	15,096	9,263

a-Three month period ended Dec. 31, 1969.

AUTOMATED MARKETING EARNING SYSTEMS, INC.

Three Months Ended Mar. 31

	1970	1969
Shr Ernd	$.12	$.21
Revenue	2,154,608	1,457,935
Earnings	75,014	118,767

This report is unaudited and subject to year end adjustments.

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Acquisitions

Systems Engineering Laboratories, Inc., a manufacturer of digital computers, custom systems, and keyboard data entry systems, and **Computer Peripherals Corp.**, a manufacturer of head-per-track disk units, jointly announced today that they have reached an agreement in principle under which Systems will offer to acquire all of Computer Peripherals' stock.

Over the past two years, Computer Peripherals has developed and has just begun to manufacture fixed head disk drives which are used as peripheral equipment in digital computer systems. Systems anticipates integrating the disks into its product line and also marketing the products on an OEM basis.

Under terms of the agreement in principle, Systems will offer to exchange one share of its common stock for each 15 shares of Computer Peripherals common stock. This constitutes approximately 122,000 shares of Systems stock. In addition, under certain conditions, Systems would issue up to an additional 35,000 shares of its common stock to Computer Peripherals shareholders, if the market value of the 122,000 shares of Systems' stock in August, 1971 is not $5,500,000. The agreement is subject to approval of the boards of directors of both companies and the shareholders of Computer Peripherals.

Systems, based in Fort Lauderdale, markets its computers, systems and other products through direct sales and service locations in major cities across the U.S., Canada and Europe.

Computer Peripherals is based in San Diego. The company's disks have a transfer rate of 3-million bit/sec with storage of 24-million or 48-million bits.

The majority interest in **Tulsatronics Computing Corp.**, Tulsa, has been acquired by **Mecca Computer Systems Inc.** Mecca, a publicly held corporation, has two subsidiaries in Alberquerque – **Automated Processing Corp.**, and **New-Mex Forms, Inc.** Terms of the agreement were not disclosed.

Fimaco, Inc. has acquired **American Computer Graphics Corp.** (ACG) in exchange for 75,000 Fimaco shares. ACG is in Cinnaminson, N.J., and serves printers and publishers through the use of computerized photocomposition equipment.

American Data Systems Inc., has acquired **Liberty Consultants, Inc.** The Liberty company has developed a low-cost cathode ray terminal. The purchase was for an undisclosed amount of stock.

Wells Management Corp. has acquired **Business Careers, Inc.**, the executive search firm for the retailing industry. The acquisition involved an undisclosed amount of cash. Business Careers, Inc. has recruited more than 300 persons annually for positions ranging from buyer to controller to company president with retail establishments throughout the U.S. and Canada.

Academy Computing Corp., Oklahoma City, has agreed in principle with **Data Network Corp.**, New York, to acquire **Com-Tel Network Corp.**, Data's time-sharing subsidiary which has sales offices in Dallas, Houston, Tulsa, and New Orleans, for an undisclosed number of shares of Academy Computing.

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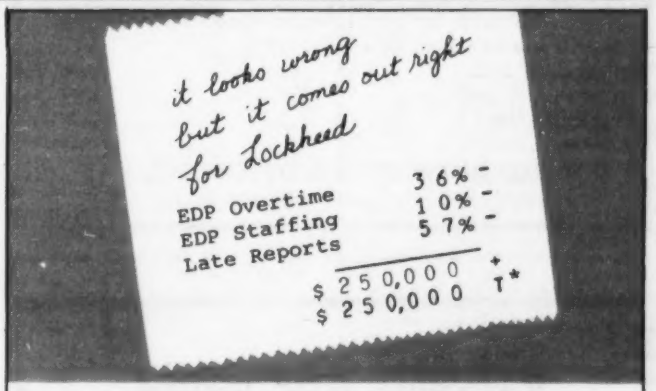

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DiComes on Stocks

New Products Brighten PIC's Prospects

As Shakespeare once said: "My pride fell with my fortunes." Hopefully, after predicting joy and an upsurge in the market for the last month, we can look forward to the day of reckoning for this bear market. As usual, all of us have something to say, but we don't always have the right listeners!

Let's look at the blue chips. The management of these companies has much to face in this market. Selling at depressed prices, accused of overspending of capital for technological advances – let's pity the jewels of the stock market!

Steel Price Increases

Bethlehem Steel recently increased the price of steel sheets by 4.7%, effective June 1, laughing at the face of inflation. If we remember, President Kennedy, not too long ago, found this a cause for alarm. Are the current market purveyors unaware of this abetment to the inflationary spiral? If not, then aren't we safe in assuming that our inflation is here to stay?

But further, if the market critics don't rise to this baiting by one of the largest steel producers, be sure that the Federal Reserve Board will. The opportunity to buy on lower margin requirements cannot help but give our favorites a chance for truer recognition of value in the money market.

Incomes are up. Bank presidents like the size of their depositors' accounts. A pickup in general business is appearing "just around the corner." But yet, my chartist, Rob Morley, tapes new sheets mournfully to the bottom of his stock charts . . . I thought surely I'd never see Burroughs below 130, Telex below 90, or Potter below 30 again in the near future! Ah yes, what fools we mortals be!

A Look at Potter!

Potter Instruments (American Stock Exchange: Symbol PIC) has been in my model portfolio since its inception on March 23 of this year. Like all the computer stocks, it has sagged hopelessly in a ravaged market.

Trading on the Curb, PIC has 2.7 million shares outstanding, of which more than 50% are held by management. These comments that follow constitute the major portion of my reasoning for including it in my portfolio. The company is a leading peripheral equipment manufacturer for computer systems and shares in a market which can be conservatively expected to grow from the $70 million in 1966 to a possible $3.5 to $4 billion in 1971.

While completely diversified in the peripheral field, PIC constantly comes forth with new developments, one of the newest being its character recognition system (magnetic). On cards similar to IBM punch cards, a standard language text and magnetic code are produced.

PIC MCR Systems

Being researched now is a card reader which can feed data to a computer. The PIC MCR System can improve by three times the current IBM 96 char/card. This system is on a one-year study with both the IBM 360 and 3 systems.

Another system (7% of total income) is the Picomm which is used with numerically controlled machine tools and has proven to be more efficient and quicker in checking production parts dimensions than a control specialist with hand tools. This device sells in the $9,000 to $30,000 range.

Other Potter products include digital tape transports (the sales of which constitute two-thirds of the current market) which are plug-to-plug compatible with IBM Systems 360, 7200, and 1400 Series computers.

Single Capstan

PIC's transports use only one drive capstan which is novel and good in that it gives less wear and longer life to the magnetic tape with a minimum of chance for error occurrence (as opposed to the dual capstan systems of the giants – Telex, Ampex, and Texas Instruments).

PIC also produces chain printers for high-speed data printout from a central unit. The vertical misregistration obtained with standard drum printers is eliminated through PIC's use of a horizontally moving chain on which the characters are driven.

IBM plug-to-plug compatible disk drives and disk drive controllers are also among PIC's products. PIC alone has produced a replacement (DD 4314) for the high-storage capacity IBM 2314 drive. The DD 4314 with PIC's disk drive controller (DC 5314) has wider capabilities than the analogous IBM system and costs less.

The use of punched cards for data input has been avoided by PIC's Key Data Recorder (KDR) which transmits source material directly to magnetic tape, which can be used on-line.

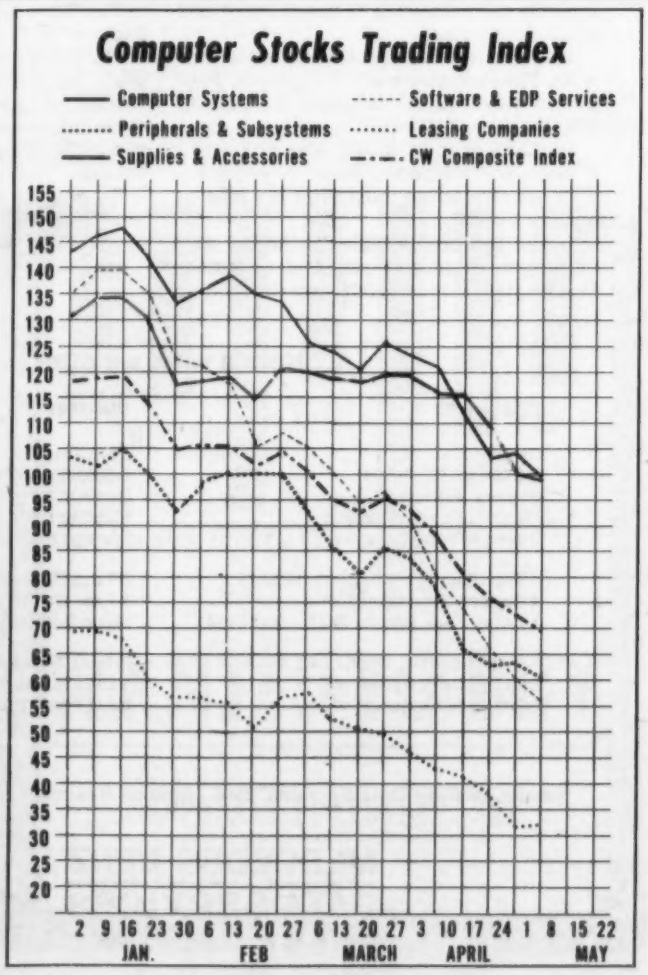
Management Assistance Incorporated (MAI), a third party leasing company, contracted for all of PIC's tape transports other than those sold to the U.S. Government until recently. Because of difficulties in accepting adequate delivery in the past two years, PIC initiated arbitration with MAI and now has the right to sell to whomever it wishes.

By an excellent book-keeping system and general good business practices, PIC stands as a strongly financed and well-run contributor to the computer neighborhood. Selling at about 35 times estimated 1970 earnings, PIC is an outstanding vehicle for gains in the imminent future!

Diebold Quarter Revenues Rise

SADDLE BROOK, N.J. – Diebold Computer Leasing, Inc. has revealed first quarter 1970 revenues of $8,159,000 and net earnings of $382,000 or 10 cents per share. Comparable figures for the first quarter of 1969 were revenues of $7,244,000 and net earnings of $427,000, or 9 cents per share.

Diebold President John J. Graham stated that the record high interest rates of 1969 generally were not fully reflected in 1969 earnings until after the first quarter of 1969.



Computerworld Stock Trading Summary

NEW YORK AND AMERICAN STOCK EXCHANGE CLOSING PRICES, FRIDAY, MAY 8;
OVER THE COUNTER AND NATIONAL STOCK EXCHANGE, THURSDAY, MAY 7

SUPPLIES & ACCESSORIES

EXCH	1970 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK PERCENT CHANGE
N	15- 9	11	1/8	ADAMS-MILLIS CORP	+ 1/8	+ 1.14
O	21- 14	15		BALTIMORE BUS FORM	---	----
A	25- 9	9	7/8	BARRY WRIGHT	- 1/4	- 2.47
A	35- 21	23	1/8	DATA DOCUMENTS	- 5/8	- 2.63
N	19- 12	13	1/8	ENNIS BUS. FORMS	- 1 5/8	- 11.02
N	166- 63	80	3/4	MEMOREX	+ 1 1/4	+ 1.57
N	114- 89	94		3M COMPANY	---	----
O	38- 33	33	7/8	MOORE BUS FORMS	- 1/4	- 0.73
N	43- 25	25		NASHUA CORP.	- 3	- 10.71
O	48- 30	32	1/2	REYNOLDS & REYNOLD	+ 1	+ 3.17
O	30- 23	24		STANDARD REGISTER	- 3/4	- 3.03
N	39- 27	27	5/8	UARCO	- 7/8	- 3.07
A	30- 11	13	1/4	WABASH MAGNETICS	---	----
O	41- 31	31	3/4	WALLACE BUS FORMS	- 1/4	- 0.78

COMPUTER SYSTEMS

EXCH	1970 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK PERCENT CHANGE
N	172-118	124	7/8	BURROUGHS CORP	- 4 1/8	- 3.20
N	37- 18	18	1/2	COLLINS RADIO	- 2	- 9.76
N	122- 40	42	5/8	CONTROL DATA CORP	- 1 3/8	- 3.12
A	124- 72	78	1/2	DIGITAL EQUIPMENT	- 6 1/2	- 7.65
N	11- 5	5	3/4	ELECTRONIC ASSOC.	- 7/8	- 13.21
A	14- 6	6	3/8	ELECTRONIC ENGINEER.	+ 1/8	+ 2.00
N	39- 29	29	7/8	FOXBORO	- 1 1/8	- 3.63
O	42- 13	16		GENERAL AUTOMATION	+ 2 1/2	+ 18.52
N	77- 67	69	1/4	GENERAL ELECTRIC	- 2 1/8	- 2.98
N	45- 34	34	1/2	HEWLETT-PACKARD CO	- 6 3/4	- 16.36
N	152-112	115	3/4	HONEYWELL INC	- 3 3/4	- 3.14
N	387-270	290		IBM	- 6 3/4	- 2.27
N	62- 58	60	1/2	NCR	---	----
N	34- 23	24	3/8	RCA	+ 3/8	+ 1.56
N	33- 20	22	3/8	RAYTHEON CO	- 1 1/8	- 4.79
O	8- 2	4	1/4	SCI. CONTROL CORP.	- 1/2	- 10.53
N	40- 24	28	5/8	SPERRY RAND	+ 7/8	+ 3.15
A	49- 21	21	7/8	SYSTEMS ENG. LABS	- 3 5/8	- 14.22
N	29- 16	17	5/8	VARIAN ASSOCIATES	- 7/8	- 4.73
A	51- 28	29	3/8	WANG LABS.	- 1 5/8	- 5.24
N	115- 77	82	3/4	XEROX CORP	- 2 3/4	- 3.22

LEASING COMPANIES

EXCH	1970 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK PERCENT CHANGE
O	9- 5	6		BANISTER CONTIN	- 1/4	- 4.00
O	25- 14	18	1/2	BOOTHE COMPUTER	+ 4	+ 27.59
O	8- 4	4	1/2	BRESNAHAN COMP.	- 1/4	- 5.26
O	8- 4	4	1/2	COMPUTER EXCHANGE	---	----
O	18- 4	5	1/4	COMPUTER LEASING	- 1/4	- 4.55
O	15- 4	4		CYBER-TRONICS	- 1	- 20.00
N	32- 8	9		DATA PROC. F & G	- 2	- 18.18
O	8- 4	4	1/2	DATRONIC RENTAL	---	----
A	24- 14	14	1/8	DEARBORN COMPUTER	+ 1/8	+ 0.89
O	8- 4	5	1/2	DIFROLD COMP. LEAS.	- 1/2	- 8.33
A	10- 5	5	3/8	DPA. INC.	+ 1/4	+ 4.88
A	22- 10	13	3/4	GRANITE MGT	+ 2 3/8	+ 20.88
A	44- 6	7	1/4	GREYHOUND COMPUTER	- 1/2	- 6.45
N	30- 12	13		LEASCO DATA PROC.	- 1/8	- 0.95
O	5- 3	3	5/8	LECTRO COMP LEAS	- 3/8	- 9.38
A	19- 4	5		LEVIN-TOWNSEND CMP	- 1/8	- 2.44
O	3- 1	1	7/8	LMC DATA. INC.	---	----
O	4- 1	2	3/8	MANAGEMENT ASSIST	+ 1/2	+ 26.67
O	8- 5	6		NCC LEASING	- 1/2	- 7.69
O	8- 3	3	3/4	SYSTEM CAPITAL	- 1/4	- 6.25
A	19- 12	14	1/8	U.S. LEASING	+ 1/8	+ 0.89

PERIPHERALS & SUBSYSTEMS

EXCH	1970 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK PERCENT CHANGE
N	62- 30	30	5/8	ADDRESSOGRAPH-MULT	- 3 1/2	- 10.26
O	15- 5	5	1/8	ALPHANUMERIC	- 3/8	- 6.82
N	48- 18	19	1/4	AMPEX CORP	- 2 3/4	- 12.50
A	34- 8	10	1/4	ASTRODATA	- 5/8	- 5.75
O	11- 6	6	3/4	BOLT,BERANEK & NEW	---	----
N	14- 8	8	7/8	BUNKER-RAMO	- 7/8	- 8.97
A	33- 16	18	1/4	CALCOMP	- 2 1/8	- 10.43
O	13- 4	6	1/4	COGNITRONICS	+ 1 3/4	+ 38.89
O	12- 6	6	1/2	COLORADO INST.	- 1	- 13.33
O	36- 17	17	1/2	COMPUTER COMMUN.	+ 1/2	+ 2.94
A	12- 5	6		COMPUTER EQUIPMENT	+ 1/4	+ 4.35
A	28- 19	21	1/8	COMPUTEST	- 1	- 4.52
A	25- 12	13	3/4	DATA PRODUCTS CORP.	- 3/4	- 5.17
O	23- 10	10	3/4	DATA TECHNOLOGY	- 2 1/2	- 18.87
O	13- 7	7	1/4	DIGITRONICS	- 1/2	- 6.45
N	40- 17	18	1/4	ELECTRONIC M & M	- 7/8	- 4.58
O	8- 4	4	1/2	FABRI-TEK	- 1/4	- 5.26
O	17- 4	4	1/2	FARRINGTON MFG	- 1/4	- 5.26
O	20- 7	7	1/2	INFORMATION DIS	- 1 1/2	- 16.67
A	67- 23	25	3/4	MARSHALL INDUSTRIES	- 1 1/8	- 4.19
A	84- 25	30		MILGO ELECTRONICS	- 3/8	- 1.23
N	87- 38	42	3/8	MOHAWK DATA SCI.	+ 1 1/4	+ 3.04
O	52- 21	21		OPTICAL SCANNING	- 3	- 12.50
O	17- 4	7	3/8	PHOTON	+ 3/8	+ 5.36
O	4- 2	---		PHOTO-MAGNETIC SYS.	---	----
A	42- 27	32	1/4	POTTER INSTRUMENT	- 3/4	- 2.27
O	25- 12	14		PRECISION INST.	---	----
O	83- 26	28		RECOGNITION EQUIP	- 2	- 6.67
O	34- 12	15		REDCOR CORP.	+ 1/2	+ 3.45
N	29- 12	13	1/2	SANDERS ASSOCIATES	- 1/4	- 1.82
O	53- 13	13		SCAN DATA	---	----
O	23- 11	13	1/2	TALLY CORP.	+ 2	+ 17.39
N	25- 16	19	1/4	TELEX	---	----
O	50- 15	15	1/2	VIATRON	- 4	- 20.51

SOFTWARE & EDP SERVICES

EXCH	1970 RANGE	CLOSING PRICE			WEEK NET CHANGE	WEEK PERCENT CHANGE
O	6- 2	2	3/4	ADVANCED COMP TECH	- 1/4	- 8.33
A	24- 4	5	3/4	APPLIED DATA RES.	---	----
O	18- 5	6	1/2	APPLIED LOGIC	+ 1/2	+ 8.33
O	8- 2	2	1/8	ARIES	+ 1/8	+ 6.25
A	47- 27	28	5/8	AUTOMATIC DATA PRC	- 3 5/8	- 11.24
O	14- 8	8		AUTO SCIENCES	- 1/4	- 3.03
O	9- 3	3	1/4	BRANDON APPL SYS	---	----
O	3- 1	1	1/2	COMPUTER AGE INDUS.	+ 1/4	+ 20.00
A	12- 4	4	1/2	COMPUTER APPL	- 1/2	- 10.00
O	14- 5	5		COMPUTER ENVIRON	- 1 1/2	- 23.08
NAT	10- 3	8		COMPUTER INDUS.	+ 1 1/4	+ 18.52
O	13- 4	4		COMPUTER NETWORK	- 1 3/4	- 30.43
O	15- 6	8	1/2	COMP. PROPERTY	- 1	- 10.53
N	34- 11	12	1/4	COMPUTER SCIENCES	- 3/4	- 5.77
O	8- 5	5	3/4	COMPUTER USAGE	- 1/2	- 8.00
A	75- 26	29		COMPUTING & SOFT	- 1 1/4	- 4.13
O	9- 4	4		COMRESS	- 3/8	- 8.57
O	14- 5	5	1/4	COMSHARE	- 1/4	- 4.55
O	3- 1	1	3/8	CONSOL. ANAL. CENT.	+ 1/8	+ 10.00
O	24- 7	7	1/4	DATA AUTOMATION	+ 1/4	+ 3.57
O	28- 12	12	1/2	DATA PACKAGING	- 1 1/4	- 9.09
O	6- 2	2	5/8	DATAMATION SERVICE	+ 1/8	+ 5.00
O	9- 5	6	3/4	DATATAB	- 1/2	- 6.90
O	4- 2	2	1/4	DIGITEK	- 1/2	- 18.18
O	13- 7	7	1/4	EDP RESOURCES	- 3/4	- 9.38
A	11- 5	6	3/8	ELECT COMP PROG	+ 3/8	+ 6.25
O	161- 60	60		ELECTRONIC DATA SYS.	- 10	- 14.29
O	20- 5	6		INFORMATICS	- 1 3/4	- 22.58
A	25- 10	10	3/8	ITEL	- 1 3/8	- 11.70
O	7- 1	1	3/4	LEVIN-TOWNSEND SERV.	---	----
A	25- 14	16	1/4	MANAGEMENT DATA	- 7/8	- 5.11
O	8- 3	3	1/2	NAT COMP ANALYSTS	- 1	- 22.22
O	12- 3	10	1/2	NAT.COMP. SERV.	+ 1/2	+ 5.00
N	54- 21	21	5/8	PLANNING RESEARCH	- 1 1/8	- 4.95
O	27- 13	13		PROGRAMMING METHODS	- 1 1/2	- 10.34
O	5- 3	3		PROGRAMMING & SYS	---	----
O	33- 7	9	1/4	PROGRAMMING SCIENCES	+ 2 1/4	+ 32.14
N	14- 4	5	1/8	SCIENTIFIC RESOURCES	- 7/8	- 14.58
O	2- 1	1		SOFTWARE SYSTEMS	---	----
O	3- 2	---		STRATEGIC SYS	---	----
O	27- 9	11		TBS COMP CENT INC.	+ 1/2	+ 4.76
O	4- 2	3	1/2	UNITED DATA CENTER	---	----
N	99- 28	32	7/8	UNIVERSITY COMP.	- 3/4	- 2.23
A	20- 5	8		URS SYSTEMS	+ 1 1/2	+ 23.08
O	13- 5	5	3/4	U.S. TIME SHARING	- 1/2	- 8.00

New Registrations

TOTAL COMPUTER SYSTEMS, 350 Fifth Ave., New York, N.Y. 10001, a company that is engaged in the business of providing computerized bookkeeping, accounting and related data services for businesses and accountants, filed to register 135,000 shares of common stock. Proceeds, at $5 per share maximum, intended for salaries, for computer rental and/or purchase of computer time, and for other related purposes, including sales promotion. The underwriter is Kluger & Ellis.

THE BUNKER-RAMO CORP., 1200 Harger Road, Oak Brook, Ill., a company engaged in manufacturing, selling and leasing electrical and electronic components, systems and services, and which produces and sells knitted deep pile fabrics, filed to register $200,000,000 of convertible subordinated debentures, due 1995. Proceeds of its sale of debentures will be used to finance capital expenditures for additional plant facilities and service equipment and related working capital needs, primarily for the Information Systems Corp. The underwriter is Allan & Co., Inc., 30 Broad St., New York, N.Y., and Hornblower & Weeks-Hemphill, Noyes, 8 Hanover St., New York, N.Y.

DYNAFACTS, INC., 1387 New Circle Road, N.E., Lexington, Ky., a company engaged in being the successor to the DP divisions of five regional certified public accounting firms; its principal business is the operation of DP service centers which specialize in the computer processing of financial and management reporting systems, filed to register 225,000 shares of common stock. Proceeds, at $15 per share maximum, intended to develop, acquire and improve sophisticated DP systems, to retire short-term debt obligations, and for down payments on the purchase of four central processing units for IBM 360/30s to replace units currently leased; the balance will be added to working capital. The underwriters are Clark, Dodge & Co., Inc., 61 Wall St., New York, N.Y. and J.J.B. Hilliard, W.L. Lyons & Co., 419 W. Jefferson St., Louisville, Ky.

MIT COMPUTER SYSTEMS, INC., 132 West 31st St., New York, N.Y., a company engaged in the following areas of the computer field: keypunch and keytape services, computer time brokerage, computer processing and personnel, filed to register 150,000 shares of common stock. Proceeds, at $5 per share, intended to be added to the company's general funds and will be available for its general corporate purposes, including working capital. The underwriter is Nagler, Weissman & Co., Inc., 462 East Tremont Ave., Bronx, N.Y.

SYSTEMS CONTROL, INC., 260 Sheridan Ave., Palo Alto, Calif., a company engaged in providing professional services for the processing of information on computers in the performance of engineering and management fuctions for industrial and governmental clients, filed to register 125,000 shares of common stock. Proceeds, at $10 per share maximum, intended to finance computer program development and the balance will be added to the company's general funds and used for working capital and possibly to acquire a majority interest in a computer service center. The underwriter is The Illinois Company Inc., 135 South LaSalle St., Chicago, Ill.

DATA FLIGHT FINANCIAL CORP., 150 S.E. Second Ave., Miami, Fla., a company organized to establish and operate joint venture financing and leasing subsidiaries in cooperation with the manufacturers of computer-related equipment, filed to register 130,000 shares of common stock. Proceeds, at $8 per share, intended to pay initial administrative and sales salaries and operating expenses, and the balance will be added to the company's general funds and used to purchase equipment leased to customers of the joint venture subsidiaries. The underwriter is Baroody & Co., 4040 Galt Ocean Drive, Ft. Lauderdale, Fla.

DYNA DATA SERVICES, INC., 2 West 45th St., New York, N.Y., a company (formally Dynatech Data Services, Inc.) organized in June, 1969 to provide computer consulting and programming services principally related to clients advertising and marketing programs, filed to register 150,000 shares of common stock. Proceeds, at $5 per share maximum, intended to repay short term bank loans used for working capital, to pay expenses incurred in connection with prior stock offering, to purchase machine tools and materials handling equipment, and the balance for general corporate purposes. The underwriter is Emanuel, Deetjen & Co., 120 Broadway, N.Y.

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